The Dunes

AP 14, Lot 65, Parcel 3
AP 13, Lot 14, Parcel 2

Coventry, Rhode Island

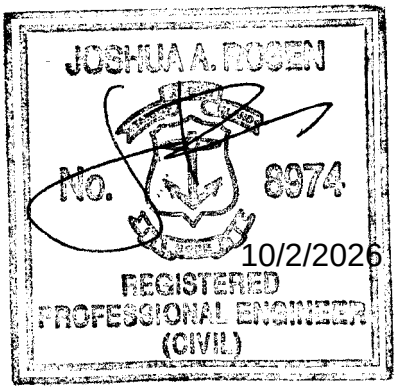
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October, 2026



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Project Description

Existing Conditions

The approximate 32.6-acre project site ("the Site") consists of A.P. 14 Lots 65, Parcel 3, and AP 13, Lot 14, Parcel 2. Center of New England Boulevard is to the south and Angelina Drive is to the west. The majority of the Site has been disturbed and is vacant with several sandy/gravel trails bisecting the site. The existing conditions survey of the Site shows on average about 8-12 feet of soil was removed. Mounds and wooded areas remain. The site is surrounded by wetlands to east, south, and west. To the north is vacant land slated for future residential development as part of Center of New England Master Plan.

The site slopes gently from southwest to northeast, from elevation 290 to elevation 270. Refer to Figure 2 for existing drainage patterns.

Based on the NRCS mapping and VHB testing on site on August 12 and 13, 2026, the in-situ soils are a sand / sandy loam texture and are classified primarily as Hydrologic Soil Group (HSG) A.

Proposed Conditions

The project involves the construction of residential units consisting of duplex, fourplex, and multi-family (8 units) structures. Access to the Site is from Center of New England Boulevard. A private, internal roadway network will provide access to the units. Additional improvements include landscaping, stormwater infrastructure, and park-like amenity spaces for the residents. Low impact development (LID) and

other best management practices (BMPs) have been proposed to mitigate the impact of this activity. Existing drainage patterns were maintained to the maximum extent practicable in the proposed design.

The proposed design includes below grade storage and infiltration, RETAIN IT units, and one infiltration basin. Pretreatment requirements are achieved through the use of sediment forebays, and Cascade Separators (CS) units scattered throughout the site. The stormwater approach will meet the Town of Coventry and Rhode Island Department of Environmental Management requirements.

The 10 Minimum Standards, as defined in the Stormwater Management, Design, and Installation Rules, have been met with the exception of Minimum Standard 5, Overbank Flood Protection. This Standard requires a downstream analysis be performed. The project requests a waiver from this requirement. This waiver request is based on the fact that the only runoff leaving the site is flow to Wetland A and E where flow rates and velocities are reduced from pre-developed conditions, and no structures are impacted. The remainer of runoff is fully infiltrated or contained on-site because the existing perimeter is at a higher elevation.

Design Point 1 Off Site North

Peak Runoff Rate			
Existing Conditions		**Proposed Conditions**	
2-year storm:	0.28 CFS	2-year storm:	0.00 CFS
10-year storm:	5.76 CFS	10-year storm:	1.06 CFS
25-year storm:	25.59 CFS	25- year storm:	7.87 CFS
100-year storm:	80.44 CFS	100-year storm:	26.78 CFS

Design Point 2 Depression NW

Peak Runoff Rate			
Existing Conditions		**Proposed Conditions**	
2-year storm:	0.0 CFS	2-year storm:	0.00 CFS
10-year storm:	0.0 CFS	10-year storm:	0.01 CFS
25-year storm:	0.04 CFS	25- year storm:	0.08 CFS
100-year storm:	0.57 CFS	100-year storm:	0.90 CFS

Design Point 3 Wetland A

Peak Runoff Rate			
Existing Conditions		**Proposed Conditions**	
2-year storm:	0.18 CFS	2-year storm:	0.00 CFS
10-year storm:	0.40 CFS	10-year storm:	0.00 CFS
25-year storm:	0.63 CFS	25- year storm:	0.00 CFS
100-year storm:	1.09 CFS	100-year storm:	0.02 CFS

Design Point 4 Wetland E

Peak Runoff Rate

Existing Conditions		Proposed Conditions	
2-year storm:	0.13 CFS	2-year storm:	0.00 CFS
10-year storm:	0.29 CFS	10-year storm:	0.00 CFS
25-year storm:	0.45 CFS	25- year storm:	0.00 CFS
100-year storm:	0.77 CFS	100-year storm:	0.00 CFS

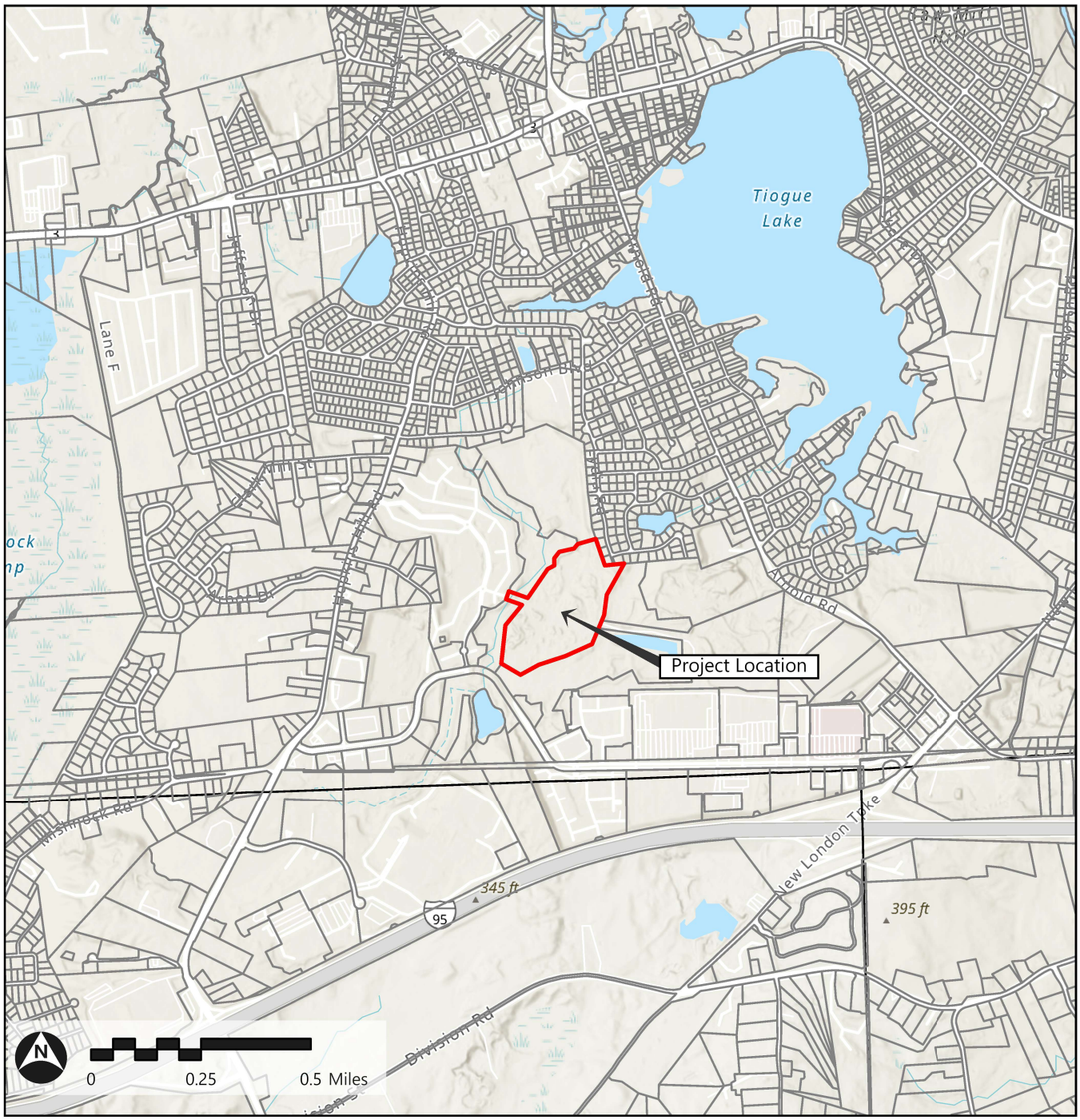
Site Surface Coverage Tabulation (Overall Drainage Area)

Ground Cover Summary

Existing Conditions		Proposed Conditions	
Impervious Surface	0.0 AC	Impervious Surface	13.67 AC
Pervious Surface	32.6 AC	Pervious Surface	19.03 AC

Figure 1.0: Project Location Map

Center of New England Lot#3| Coventry, RI



RI Tax Parcels

RI Municipal Boundaries

Project Area

Source: Rhode Island Dept. of Transportation, MIS/GIS Section, Two Capital Hill, Providence, R.I. 02908-5872, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, NASA, NGA, USGS FEMA

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Appendix A –RIDEM Stormwater Management Checklist and LID Planning Report

APPENDIX A: STORMWATER MANAGEMENT PLAN CHECKLIST AND LID PLANNING REPORT – STORMWATER DESIGN SUMMARY

PROJECT NAME **The Dunes**	RIDEM USE ONLY) STW/WQC File #: Date Received:
TOWN **Coventry, Rhode Island**	
BRIEF PROJECT DESCRIPTION: The project involves the construction of residential units consisting of duplex, fourplex, and multi-family (8 units) structures. Access to the Site is from Center of New England Boulevard. A private, internal roadway network will provide access to the units. Additional improvements include landscaping, stormwater infrastructure, and park-like amenity spaces for the residents.	

Stormwater Management Plan (SMP) Elements – Minimum Standards

When submitting a SMP,[1] submit four separately bound documents: Appendix A Checklist; Stormwater Site Planning, Analysis and Design Report with Plan Set/Drawings; Soil Erosion and Sediment Control (SESC) Plan, and Post Construction Operations and Maintenance (O&M) Plan. Please refer to Suggestions to Promote Brevity.

Note: **All stormwater construction projects must create a Stormwater Management Plan (SMP). However, not every element listed below is required per the RIDEM Stormwater Rules and the RIPDES Construction General Permit (CGP). This checklist will help identify the required elements to be submitted with an Application for Stormwater Construction Permit & Water Quality Certification.**

PART 1. PROJECT AND SITE INFORMATION

PROJECT TYPE (Check all that apply)

☒ Residential	☐ Commercial	☐ Federal	☐ Retrofit	☐ Restoration
☒ Road	☐ Utility	☐ Fill	☐ Dredge	☐ Mine
☐ Other (specify):				

SITE INFORMATION

☒ Vicinity Map

INITIAL DISCHARGE LOCATION(S): The WQv discharges to: (You may choose more than one answer if several discharge points are associated with the project.)

☐ **Groundwater**	☒ **Surface Water**	☐ **MS4**
☐ GAA	☒ Isolated Wetland	☐ RIDOT
☒ GA	☐ Named Waterbody	☐ RIDOT Alteration Permit is Approved
☐ GB	☐ Unnamed Waterbody Connected to Named Waterbody	☐ Town
		☐ Other (specify):

ULTIMATE RECEIVING WATERBODY LOCATION(S): Include pertinent information that applies to both WQ_v and flow from larger storm events including overflows. Choose all that apply, and repeat table for each waterbody.

☒ Groundwater or Disconnected Wetland	☐ SRWP		
☒ Waterbody Name: **Tributary to Tiogue Lake**	☐ Coldwater	☐ Warmwater	☒ Unassessed
☒ Waterbody ID: **R100006014R-05**	☐ 4th order stream of pond 50 acres or more		
☒ TMDL for: **Enterococcus**	☐ Watershed of flood prone river (e.g., Pocasset River)		
☐ Contributes to a priority outfall listed in the TMDL	☐ Contributes stormwater to a public beach		

[1] Applications for a Construction General Permit that do not require any other permits from RIDEM and will disturb less than 5 acres over the entire course of the project do not need to submit a SMP. The Appendix A checklist must still be submitted.

☒ 303(d) list – Impairment(s) for: **Enterococcus**	☐ Contributes to shellfishing grounds

PROJECT HISTORY		
☒ RIDEM Pre- Application Meeting	Meeting Date: August 27, 2026	☒ Minutes Attached
☒ Municipal Master Plan Approval	Approval Date:	☐ Minutes Attached
☐ Subdivision Suitability Required	Approval #:	
☐ Previous Enforcement Action has been taken on the property	Enforcement #:	

FLOODPLAIN & FLOODWAY See Guidance Pertaining to Floodplain and Floodways	
☐ Riverine 100-year floodplain: **FEMA FLOODPLAIN FIRMETTE** has been reviewed and the 100-year floodplain is on site	
☐ Delineated from FEMA Maps	
NOTE: Per Rule 250-RICR-150-10-8-1.1(B)(5)(d)(3), provide volumetric floodplain compensation calculations for cut and fill/displacement calculated by qualified professional	
☐ Calculated by Professional Engineer	
☐ Calculations are provided for cut vs. fill/displacement volumes proposed within the 100-year floodplain	Amount of Fill (CY):
	Amount of Cut (CY):
☐ Restrictions or modifications are proposed to the flow path or velocities in a floodway	
☐ Floodplain storage capacity is impacted	
☒ Project area is not within 100-year floodplain as defined by RIDEM	

CRMC JURISDICTION
☐ CRMC Assent required
☐ Property subject to a Special Area Management Plan (SAMP). If so, specify which SAMP:
☐ Sea level rise mitigation has been designed into this project

LUHPPL IDENTIFICATION - MINIMUM STANDARD 8:			
1. OFFICE OF Land Revitalization and Sustainable Materials Management (OLRSMM)			
	☐ Known or suspected releases of HAZARDOUS MATERIAL are present at the site (Hazardous Material is defined in Rule 1.4(A)(33) of 250-140-30-1 of the RIDEM Rules and Regulations for Investigation and Remediation of Hazardous Materials (the Remediation Regulations))		**RIDEM CONTACT:**
	☐ Known or suspected releases of PETROLEUM PRODUCT are present at the site (Petroleum Product as defined in Rule 1.5(A)(84) of 250-140-25-1 of the RIDEM Rules and Regulations for Underground Storage Facilities Used for Regulated Substances and Hazardous Materials)		
	☐ This site is identified on the RIDEM Environmental Resources Map as one of the following regulated facilities		**SITE ID#:**
		☐ CERCLIS/Superfund (NPL)	
		☐ State Hazardous Waste Site (SHWS)	
		☐ Environmental Land Usage Restriction (ELUR)	
		☐ Leaking Underground Storage Tank (LUST)	
		☐ Closed Landfill	
Note: If any boxes in 1 above are checked, the applicant must contact the RIDEM OLRSMM Project Manager associated with the Site to determine if subsurface infiltration of stormwater is allowable for the project. Indicate if the infiltration corresponds to "Red," "Yellow" or "Green" as described in Section 3.2.8 of the RISDISM Guidance (Subsurface Contamination Guidance). Also, note and reference approval in PART 3, Minimum Standard 2: Groundwater Recharge/Infiltration.			
2. PER MINIMUM STANDARD 8 of RICR 8.14.C.1-6 "LUHPPLS," THE SITE IS/HAS:			
	☐ Industrial Site with RIPDES MSGP, except where No Exposure Certification exists. http://www.dem.ri.gov/programs/water/permits/ripdes/stormwater/status.php		
	☐ Auto Fueling Facility (e.g., gas station)		
	☐ Exterior Vehicles Service, Maintenance, or Equipment Cleaning Area		

	☐ Road Salt Storage and Loading Areas (exposed to rainwater)	
	☐ Outdoor Storage and Loading/Unloading of Hazardous Substances	
3.	**STORMWATER INDUSTRIAL PERMITTING**	
	☐ The site is associated with existing or proposed activities that are considered Land Uses with Higher Potential Pollutant Loads (LUHPPLS) (see RICR 8.14.C)	Activities: Sector:
	☐ Construction is proposed on a site that is subject to THE MULTI-SECTOR GENERAL PERMIT (MSGP) UNDER RULE 31(B)15 OF THE RIPDES REGULATIONS.	MSGP permit #
	☐ Additional stormwater treatment is required by the MSGP Explain:	

REDEVELOPMENT STANDARD – MINIMUM STANDARD 6		
☒ Pre Construction Impervious Area		
	☒ Total Pre-Construction Impervious Area (**TIA**) = 0.0 Acres	
	☒ Total Site Area (**TSA**) = 32.6 Acres	
	☒ Jurisdictional Wetlands (**JW**) = 7.75 Acres	
	☐ Conservation Land (**CL**)	
☒ Calculate the Site Size (defined as contiguous properties under same ownership)		
	☒ Site Size (**SS**) = (**TSA**) – (**JW**) – (**CL**) = (32.6) - (7.8) -(0) = 24.8 Acres	
	☒ (**TIA**) / (**SS**) = (0)/(24.8) = 0	☐ (**TIA**) / (**SS**) >**0.4**?
☐ YES, Redevelopment		

PART 2. LOW IMPACT DEVELOPMENT ASSESSMENT – MINIMUM STANDARD 1

(NOT REQUIRED FOR REDEVELOPMENT OR RETROFITS)
This section may be deleted if not required.

Note: A written description must be provided specifying why each method is not being used or is not applicable at the Site. Appropriate answers may include:

- Town requires … (state the specific local requirement)
- Meets Town's dimensional requirement of …
- Not practical for site because …
- Applying for waiver/variance to achieve this (pending/approved/denied)
- Applying for wavier/variance to seek relief from this (pending/approved/denied)

A) PRESERVATION OF UNDISTURBED AREAS, BUFFERS, AND FLOODPLAINS	**IF NOT IMPLEMENTED, EXPLAIN HERE**
☒ Sensitive resource areas and site constraints are identified (required) ☒ Local development regulations have been reviewed (required) ☒ All vegetated buffers and coastal and freshwater wetlands will be protected during and after construction ☐ Conservation Development or another site design technique has been incorporated to protect open space and pre-development hydrology. **Note:** If Conservation Development has been used, check box and skip to Subpart C ☒ As much natural vegetation and pre-development hydrology as possible has been maintained	

B) LOCATE DEVELOPMENT IN LESS SENSITIVE AREAS AND WORK WITH THE NATURAL LANDSCAPE CONDITIONS, HYDROLOGY, AND SOILS ☒ Development sites and building envelopes have been appropriately distanced from wetlands and waterbodies ☒ Development and stormwater systems have been located in areas with greatest infiltration capacity (e.g., soil groups A and B) ☐ Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPA's) ☒ Development sites and building envelopes have been positioned outside of floodplains ☒ Site design positions buildings, roadways and parking areas in a manner that avoids impacts to surface water features ☒ Development sites and building envelopes have been located to minimize impacts to steep slopes (≥15%) ☐ Other (describe):	Disturbance of steep slopes around the perimeter of the site have been avoided. The site is previously disturbed.
C) MINIMIZE CLEARING AND GRADING ☒ Site clearing has been restricted to <u>minimum area needed</u> for building footprints, development activities, construction access, and safety. ☒ Site has been designed to position buildings, roadways, and parking areas in a manner that minimizes grading (cut and fill quantities) ☐ Protection for stands of trees and individual trees and their root zones to be preserved has been specified, and such protection extends at least to the tree canopy drip line(s) ☐ Plan notes specify that public trees removed or damaged during construction shall be replaced with equivalent	The site is previously disturbed and cleared.
D) REDUCE IMPERVIOUS COVER ☐ Reduced roadway widths (≤22 feet for ADT ≤ 400; ≤ 26 feet for ADT 400 - 2,000) ☐ Reduced driveway areas (length minimized via reduced ROW width (≤ 45 ft.) and/or reduced (or absolute minimum) front yard setback; width minimized to ≤ 9 ft. wide one lane; ≤ 18 ft. wide two lanes; shared driveways; pervious surface) ☐ Reduced building footprint: Explain approach: ☐ Reduced sidewalk area (≤ 4 ft. wide; one side of the street; unpaved path; pervious surface) ☐ Reduced cul-de-sacs (radius < 45 ft; vegetated island; alternative turn-around) ☐ Reduced parking lot area: Explain approach ☐ Use of pervious surfaces for driveways, sidewalks, parking areas/overflow parking areas, etc. ☐ Minimized impervious surfaces (project meets or is less than maximum specified by Zoning Ordinance) ☒ Other (describe):	Design is as required by Coventry Master Plan approval and Town of Coventry design regulations.
E) DISCONNECT IMPERVIOUS AREA ☐ Impervious surfaces have been disconnected, and runoff has been diverted to QPAs to the maximum extent possible ☐ Residential street edges allow side-of-the-road drainage into vegetated open swales ☐ Parking lot landscaping breaks up impervious expanse AND accepts runoff ☒ Other (describe):	Road drainage is designed to convey runoff to stormwater BMP's with the use of curbs and catch basins.
F) MITIGATE RUNOFF AT THE POINT OF GENERATION ☒ Small-scale BMPs have been designated to treat runoff as close as possible to the source	Small scale BMP's such as sediment forebays haver been positioned on the site as close to the source as possible.

G) PROVIDE LOW-MAINTENANCE NATIVE VEGETATION ☒ Low-maintenance landscaping has been proposed using native species and cultivars ☒ Plantings of native trees and shrubs in areas previously cleared of native vegetation are shown on site plan ☐ Lawn areas have been limited/minimized, and yards have been kept undisturbed to the maximum extent practicable on residential lots	
H) RESTORE STREAMS/WETLANDS ☐ Historic drainage patterns have been restored by removing closed drainage systems, daylighting buried streams, and/or restoring degraded stream channels and/or wetlands ☐ Removal of invasive species ☒ Other	The site does not provide an opportunity to daylight streams or restore wetlands.

PART 3. SUMMARY OF REMAINING STANDARDS

GROUNDWATER RECHARGE – MINIMUM STANDARD 2		
YES	**NO**	
☒	☐	The project has been designed to meet the groundwater recharge standard.
☐	☐	If "No," the justification for groundwater recharge criterion waiver has been explained in the Narrative (e.g., threat of groundwater contamination or physical limitation), if applicable (see RICR 8.8.D);
☐	☐	Your waiver request has been explained in the Narrative, if applicable.
☐	☒	Is this site identified as a Regulated Facility in Part 1, Minimum Standard 8: LUHPPL Identification?
☐	☐	If "Yes," has approval for infiltration by the OLRSMM Site Project Manager, per Part 1, Minimum Standard 8, been requested?

TABLE 2-1: Summary of Recharge (see RISDISM Section 3.3.2)
(Add or Subtract Rows as Necessary)

Design Point	Impervious Area Treated (sq ft)	Total Re_v Required (cu ft)	LID Stormwater Credits (see RISDISM Section 4.6.1)	Recharge Required by Remaining BMPs (cu ft)	Recharge Provided by BMPs (cu ft)
			Portion of Re_v directed to a QPA (cu ft)		
DP-1:Off-Site North	599,952	29,998	0	29,998	45,658
DP-2:	0	0	0	0	0
DP-3:	0	0	0	0	0
DP-4: Wetland E	1,481	74	0	74	122
TOTALS:	601,433	30,072			45,780

Notes:
1. Only BMPs listed in RISDISM Table 3-5 "List of BMPs Acceptable for Recharge" may be used to meet the recharge requirement.
2. Recharge requirement must be satisfied for each waterbody ID.

☒ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):
Stormwater Management Report Appendix B.

WATER QUALITY – MINIMUM STANDARD 3		
YES	**NO**	
☒	☐	Does this project meet or exceed the required water quality volume WQv (see RICR 8.9.E-I)?
☒	☐	Is the proposed final impervious cover greater than 20% of the disturbed area (see RICR 8.9.E-I)?
☒	☐	If "Yes," either the Modified Curve Number Method or the Split Pervious/Impervious method in Hydro-CAD was used to calculate WQv; or,
☒	☐	If "Yes," either TR-55 or TR-20 was used to calculate WQv; and,
☐	☐	If "No," the project meets the minimum WQv of 0.2 watershed inches over the entire disturbed area.
☐	☐	Not Applicable
☒	☐	Does this project meet or exceed the ability to treat required water quality flow WQf (see RICR 8.9.I.1-3)?
☒	☐	Does this project propose an increase of impervious cover to a receiving water body with impairments? If "Yes," please indicate below the method that was used to address the water quality requirements of no further degradation to a low-quality water. Infiltration used to treat for Bacteria. Targeted reduction is 50% based on the RI DEM Statewide Bacteria TMDL. Infiltration provides 95% median pollutant removal.
☐	☒	RICR 8.36. A Pollutant Loading Analysis is needed and has been completed.
☒	☐	The Water Quality Guidance Document (Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters) has been followed as applicable.
☒	☐	BMPs are proposed that are on the approved technology list . If "Yes," please provide all required worksheets from the manufacturer.
☒	☐	Additional pollutant-specific requirements and/or pollutant removal efficiencies are applicable to the site as the result of a TMDL, SAMP, or other watershed-specific requirements. If "Yes," please describe: Infiltration used to treat for Bacteria.

TABLE 3-1: Summary of Water Quality (see RICR 8.9)					
Design Point and WB ID	**Impervious area treated (sq ft)**	**Total WQ_v Required (cu ft)**	**LID Stormwater Credits** (see RICR 8.18) **WQv directed to a QPA (cu ft)**	**Water Quality Treatment Remaining (cu ft)**	**Water Quality Provided by BMPs (cu ft)**
DP-1 **R100006014R-05**	599,952	49,996	0	49,996	49,996
DP-2:	0		0		0
DP-3:	0		0		0
DP-4:	1,481	123	0	123	123
TOTALS:	601,433	50,119	0	50,119	50,119

Notes:
1. Only BMPs listed in RICR 8.20 and 8.25 or the Approved Technologies List of BMPs is Acceptable for Water Quality treatment.
2. For each Design Point, the Water Quality Volume Standard must be met for each Waterbody ID.

☒ YES ☐ NO	This project has met the setback requirements for each BMP. If "No," please explain:

☐ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):
Stormwater Management Report Appendix C

CONVEYANCE AND NATURAL CHANNEL PROTECTION (RICR 8.10) – MINIMUM STANDARD 4		
YES	**NO**	
☐	☒	Is this standard waived? If "Yes," please indicate one or more of the reasons below:
		☐ The project directs discharge to a large river (i.e., 4th-order stream or larger. See RISDISM Appendix I for State-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters. ☐ The project is a small facility with impervious cover of less than or equal to 1 acre. ☐ The project has a post-development peak discharge rate from the facility that is less than 2 cfs for the 1-year, 24-hour Type III design storm event (prior to any attenuation). (Note: LID design strategies can greatly reduce the peak discharge rate).
☒	☐	Conveyance and natural channel protection for the site have been met. If "No,' explain why: The 1 year storm infiltrates throughout the site therefore there is no need for channel protection.

TABLE 4-1: Summary of Channel Protection Volumes (see RICR 8.10)					
Design Point	**Receiving Water Body Name**	**Coldwater Fishery? (Y/N)**	**Total CPv Required (cu ft)**	**Total CPv Provided (cu ft)**	**Average Release Rate Modeled in the 1-yr storm (cfs)**
DP-1: off Site	Trib. To Tiogue Lake	Unassessed	0	0	N/A
DP-2:	Trib. To Tiogue Lake	Unassessed	0	0	N/A
DP-3:	Trib. To Tiogue Lake	Unassessed	0	0	N/A
DP-4: Wetland E	Trib. To Tiogue Lake	Unassessed	0	0	N/A
TOTALS:					
Note: The Channel Protection Volume Standard must be met in each waterbody ID.					
☒ YES ☐ NO	The CPv is released at roughly a uniform rate over a 24-hour duration (see examples of sizing calculations in Appendix D of the RISDISM).				
☐ YES ☒ NO	Do additional design restrictions apply resulting from any discharge to cold-water fisheries; If "Yes," please indicate restrictions and solutions below.				
☒ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.). Stormwater Management Report Appendix D					

OVERBANK FLOOD PROTECTION (RICR 8.11) AND OTHER POTENTIAL HIGH FLOWS – MINIMUM STANDARD 5			
YES	**NO**		
☐	☒	Is this standard waived? If yes, please indicate one or more of the reasons below:	
		☐	The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for state-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.
		☐	A Downstream Analysis (see RICR 8.11.D and E) indicates that peak discharge control would not be beneficial or would exacerbate peak flows in a downstream tributary of a particular site (e.g., through coincident peaks).
☐	☒	Does the project flow to an MS4 system or subject to other stormwater requirements? If "Yes," indicate as follows:	
		☐	RIDOT
		☐	Other (specify):
Note: The project could be approved by RIDEM but not meet RIDOT or Town standards. RIDOT's regulations indicate that post-volumes must be **less** than pre-volumes for the 10-yr storm at the design point entering the RIDOT system. If you have not already received approval for the discharge to an MS4, please explain below your strategy to comply with RIDEM and the MS4.			
		Indicate below which model was used for your analysis. ☐ TR-55 ☐ TR-20 ☒ HydroCAD ☐ Bentley/Haestad ☐ Intellisolve ☐ Other (Specify):	
YES	**NO**		
☒	☐	Does the drainage design demonstrate that flows from the 100-year storm event through a BMP will safely manage and convey the 100-year storm? If "No," please explain briefly below and reference where in the application further documentation can be found (i.e., name of report/document, page numbers, appendices, etc.):	
☒	☐	Do off-site areas contribute to the sub-watersheds and design points? If "Yes,"	
☒	☐	Are the areas modeled as "present condition" for both pre- and post-development analysis?	
☒	☐	Are the off-site areas shown on the subwatershed maps?	
☒	☐	Does the drainage design confirm safe passage of the 100-year flow through the site for off-site runoff?	
☒	☐	Is a Downstream Analysis required (see RICR 8.11.E.1)?	
☒	☐	Calculate the following:	
	26.52	☒	Area of disturbance within the sub-watershed (areas)
	13.8	☒	Impervious cover (%)
☐	☒	Is a dam breach analysis required (earthen embankments over six (6) feet in height, or a capacity of 15 acre-feet or more, and contributes to a significant or high hazard dam)?	
☒	☐	Does this project meet the overbank flood protection standard?	

Table 5-1 Hydraulic Analysis Summary								
Subwatershed (Design Point)	**1.2" Peak Flow** (cfs) **		**1-yr Peak Flow** (cfs)		**10-yr Peak Flow** (cfs)		**100-yr Peak Flow** (cfs)	
	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)
DP-1:	0	0	0.04	0	5.76	1.06	80.44	26.78
DP-2:	0	0	0	0	0	0.01	0.57	0.90
DP-3:	0	0	0	0	0.4	0	1.09	0.02
DP-4:	0	0	0	0	0.29	0	0.77	0
TOTALS:	0	0	0.04	0	6.45	1.07	82.87	27.70

** Utilize modified curve number method or split pervious /impervious method in HydroCAD.

Note: The hydraulic analysis must demonstrate no impact to each individual subwatershed DP unless each DP discharges to the same wetland or water resource.

Indicate as follows where the pertinent calculations and/or information for the items above are provided	**Name of report/document, page numbers, appendices, etc.**
Existing conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, and water surface elevations showing methodologies used and supporting calculations.	Stormwater Management Report, Appendix E
Proposed conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, water surface elevations, and routing showing the methodologies used and supporting calculations.	Stormwater Management Report, Appendix E
Final sizing calculations for structural stormwater BMPs, including contributing drainage area, storage, and outlet configuration.	Stormwater Management Report, Appendix E
Stage-storage, inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities).	Stormwater Management Report, Appendix E

Table 5-2 Summary of Best Management Practices											
BMP ID	**DP #**	**BMP Type** (e.g., bioretention, tree filter)	**BMP Functions**					**Bypass Type**	**Horizontal Setback Criteria are met per RICR 8.21.B.10, 8.22.D.11, and 8.35.B.4**		
			Pre-Treatment (Y/N/ NA)	Re_v	WQ_v	CP_v (Y/N/ NA)	Overbank Flood Reduction (Y/N/NA)	External (E) Internal (I) or NA	Yes/ No	Technical Justification (Design Report page number)	Distance Provided
UGIN FL C	1	Below Grade Infiltration	N	Y	Y	Y	Y	NA	Y		
UGIN F B	1	Below Grade Infiltration	N	Y	Y	Y	Y	NA	Y		
UGIN F A	1	Below Grade Infiltration	N	Y	Y	Y	Y	NA	Y		
IB	1	Infiltration Basin	N	Y	Y	Y	Y	E	Y		
SFB1	1	Sediment Forebay	Y	N	Y	NA	NA	NA	Y		
SFB2	1	Sediment Forebay	Y	N	Y	NA	NA	NA	Y		
WQU 1	1	Water Quality Unit	Y	N	Y	NA	NA	I	Y		

Table 5-2 Summary of Best Management Practices											
BMP ID	**DP #**	**BMP Type** (e.g., bioretention, tree filter)	**BMP Functions**					**Bypass Type**	**Horizontal Setback Criteria are met per RICR 8.21.B.10, 8.22.D.11, and 8.35.B.4**		
			Pre-Treatment (Y/N/ NA)	Re_v	WQ_v	CP_v (Y/N/ NA)	Overbank Flood Reduction (Y/N/NA)	External (E) Internal (I) or NA	Yes/ No	Technical Justification (Design Report page number)	Distance Provided
WQU 2	1		Y	N	Y	NA	NA	I	Y		
WQU 3	1		Y	N	Y	NA	NA	I	Y		
WQU 4	1		Y	N	Y	NA	NA	I	Y		
WQU 5	1		Y	N	Y	NA	NA	I	Y		
WQU 6	1		Y	N	Y	NA	NA	I	Y		
WQU 7	1		Y	N	Y	NA	NA	I	Y		
DEP1	4	Natural Depression	NA	Y	Y	Y	Y	NA	Y		
DEP2	1	Natural Depression	NA	Y	Y	Y	Y	NA	Y		
		TOTALS:									

Table 5.3 Summary of Soils to Evaluate Each BMP									
DP #	**BMP ID**	**BMP Type** (e.g., bioretention, tree filter)	**Soils Analysis for Each BMP**						
			Test Pit ID# and Ground Elevation		SHWT Elevation (ft)	Bottom of Practice Elevation* (ft)	Separation Distance Provided (ft)	Hydrologic Soil Group (A, B, C, D)	Exfiltration Rate Applied (in/hr)
			Primary	Secondary					
1	UGINFL C	Below Grade Infiltration	TP-05	TP-04	272.0	275.0	3	A	2.41
1	UGINFL B	Below Grade Infiltration	TP-02		274.1	277.1	3	A	2.41
1	UGINFL A	Below Grade Infiltration	TP-01		273.9	276.9	3	A	8.27
1	IB	Infiltration Basin	TP-10		259.5	263.5	4	A	2.41
4	DEP1	Natural Depression/Infiltration	TP-01		273.9	284.0	10.1	A	2.41
1	DEP2	Natural Depression/Infiltration	TP-07		274.2	280.0	5.8	A	2.41

* For underground infiltration systems (UICs) bottom equals bottom of stone, for surface infiltration basins bottom equals bottom of basin, for filters bottom equals interface of storage and top of filter layer

LAND USES WITH HIGHER POTENTIAL POLLUTANTS LOADS (LUHPPLs) – MINIMUM STANDARD 8			
YES	**NO**	**N/A**	
☐	☐	☒	Describe any LUHPPLs identified in Part 1, Minimum Standard 8, Section 2. If not applicable, continue to Minimum Standard 9.
☐	☐	☐	Are these activities already covered under an MSGP? If "No," please explain if you have applied for an MSGP or intend to do so?
☐	☐	☐	List the specific BMPs that are proposed for this project that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in RISDISM Table 3-3, "Acceptable BMPs for Use at LUHPPLs." Please list BMPs:
☐	☐	☐	Additional BMPs, or additional pretreatment BMP's if any, that meet RIPDES MSGP requirements; Please list BMPs:
			Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.).

ILLICIT DISCHARGES – MINIMUM STANDARD 9			
Illicit discharges are defined as unpermitted discharges to Waters of the State that do not consist entirely of stormwater or uncontaminated groundwater, except for certain discharges identified in the RIPDES Phase II Stormwater General Permit.			
YES	**NO**	**N/A**	
☒	☐	☐	Have you checked for illicit discharges?
☐	☒	☐	Have any been found and/or corrected? If "Yes," please identify.

☒	☐	☐	Does your report explain preventative measures that keep non-stormwater discharges out of the Waters of the State (during and after construction)?

SOIL EROSION AND SEDIMENT CONTROL (SESC) – MINIMUM STANDARD 10				
YES	**NO**	**N/A**		
☒	☐	☐	Have you included a Soil Erosion and Sediment Control Plan Set and/or Complete Construction Plan Set?	
☒	☐	☐	Have you provided a **separately-bound** document based upon the SESC Template? If yes, proceed to Minimum Standard 11 (the following items can be assumed to be addressed).	
			If "No," include a document with your submittal that addresses the following elements of an SESC Plan:	
			☐	Soil Erosion and Sediment Control Plan Project Narrative, including a description of how the fifteen (15) Performance Criteria have been met:
			☐	Provide Natural Buffers and Maintain Existing Vegetation
			☐	Minimize Area of Disturbance
			☐	Minimize the Disturbance of Steep Slopes
			☐	Preserve Topsoil
			☐	Stabilize Soils
			☐	Protect Storm Drain Inlets
			☐	Protect Storm Drain Outlets
			☐	Establish Temporary Controls for the Protection of Post-Construction Stormwater Control Measures
			☐	Establish Perimeter Controls and Sediment Barriers
			☐	Divert or Manage Run-On from Up-Gradient Areas
			☐	Properly Design Constructed Stormwater Conveyance Channels
			☐	Retain Sediment On-Site
			☐	Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows
			☐	Apply Construction Activity Pollution Prevention Control Measures
			☐	Install, Inspect, and Maintain Control Measures and Take Corrective Actions
			☐	Qualified SESC Plan Preparer's Information and Certification
			☐	Operator's Information and Certification; if not known at the time of application, the Operator must certify the SESC Plan upon selection and prior to initiating site activities
			☐	Description of Control Measures, such as Temporary Sediment Trapping and Conveyance Practices, including design calculations and supporting documentation, as required

STORMWATER MANAGEMENT SYSTEM OPERATION, MAINTENANCE, AND POLLUTION PREVENTION PLAN – MINIMUM STANDARDS 7 AND 9		
Operation and Maintenance Section		
YES	**NO**	
☒	☐	Have you minimized all sources of pollutant contact with stormwater runoff, to the maximum extent practicable?
☒	☐	Have you provided a **separately-bound** Operation and Maintenance Plan for the site and for all of the BMPs, and does it address each element of RICR 8.17 and RISDISM Appendix C and E?
☒	☐	Lawn, Garden, and Landscape Management meet the requirements of RISDISM Section G.7? If "No," why not?
☒	☐	Is the property owner or homeowner's association responsible for the stormwater maintenance of all BMP's? If "No," you must provide a legally binding and enforceable maintenance agreement (see RISDISM Appendix E, page 26) that identifies the entity that will be responsible for maintenance of the stormwater. Indicate where this agreement can be found in your report (i.e., name of report/document, page numbers, appendices, etc.).
☐	☒	Do you anticipate that you will need legal agreements related to the stormwater structures? (e.g. off-site easements, deed restrictions, covenants, or ELUR per the Remediation Regulations).

		If "Yes," have you obtained them? Or please explain your plan to obtain them:
☐	☒	Is stormwater being directed from public areas to private property? If "Yes," note the following: Note: This is not allowed unless a funding mechanism is in place to provide the finances for the long-term maintenance of the BMP and drainage, or a funding mechanism is demonstrated that can guarantee the long-term maintenance of a stormwater BMP by an individual homeowner.
Pollution Prevention Section		
☒	☐	Designated snow stockpile locations?
☐	☒	Trash racks to prevent floatables, trash, and debris from discharging to Waters of the State?
☒	☐	Asphalt-only based sealants?
☐	☒	Pet waste stations? (Note: If a receiving water has a bacterial impairment, and the project involves housing units, then this could be an important part of your pollution prevention plan).
☒	☐	Regular sweeping? Please describe:
☒	☐	De-icing specifications, in accordance with RISDISM Appendix G. (NOTE: If the groundwater is GAA, or this area contributes to a drinking water supply, then this could be an important part of your pollution prevention plan).
☒	☐	A prohibition of phosphate-based fertilizers? (Note: If the site discharges to a phosphorus impaired waterbody, then this could be an important part of your pollution prevention plan).

PART 4. SUBWATERSHED MAPPING AND SITE-PLAN DETAILS

Existing and Proposed Subwatershed Mapping (REQUIRED)			
YES	**NO**		
☒	☐		Existing and proposed drainage area delineations
☒	☐		Locations of all streams and drainage swales
☒	☐		Drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in RISDISM Appendix K)
☒	☐		Complete drainage area boundaries; include off-site areas in both mapping and analyses, as applicable
☒	☐		Logs of borings and/or test pit investigations along with supporting soils/geotechnical report
☒	☐		Mapped seasonal high-water-table test pit locations
☐	☒		Mapped locations of the site-specific borings and/or test pits and soils information from the test pits at the locations of the BMPs
☒	☐		Mapped locations of the BMPs, with the BMPs consistently identified on the Site Construction Plans
☐	☐		Mapped bedrock outcrops adjacent to any infiltration BMP
☒	☐		Soils were logged by a:
		☒	DEM-licensed Class IV soil evaluator Name: Jeff Peterson #D4039
		☐	RI-registered P.E. Name:

Subwatershed and Impervious Area Summary				
Subwatershed (area to each design point)	**First Receiving Water ID or MS4**	**Area Disturbed (units)**	**Existing Impervious (units)**	**Proposed Impervious (units)**
DP-1:	Groundwater	25.82	0	13.9 AC
DP-2:	Groundwater	0.51 AC	0	0
DP-3:	R100006014R-05	0	0	0
DP-4:	R100006014R-05	0.17 AC	0	0.034 AC
TOTALS:		26.5	0	13.934 AC

Site Construction Plans (Indicate that the following applicable specifications are provided)		
YES	**NO**	
☒	☐	Existing and proposed plans (scale not greater than 1" = 40') with North arrow
☒	☐	Existing and proposed site topography (with 1 or 2-foot contours); 10-foot contours accepted for off-site areas
☒	☐	Boundaries of existing predominant vegetation and proposed limits of clearing
☒	☐	Site Location clarification
☒	☐	Location and field-verified boundaries of resource protection areas such as: ▸ freshwater and coastal wetlands, including lakes and ponds ▸ coastal shoreline features Perennial and intermittent streams, in addition to Areas Subject to Storm Flowage (ASSFs)
☒	☐	All required setbacks (e.g., buffers, water-supply wells, septic systems)
☐	☐	Representative cross-section and profile drawings, and notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include: ▸ Location and size of the stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) must have labels that correspond to RISDISM Table 5-2; ▸ Design water surface elevations (applicable storms); ▸ Structural details of outlet structures, embankments, spillways, stilling basins, grade-control structures, conveyance channels, etc.; ▸ Existing and proposed structural elevations (e.g., inverts of pipes, manholes, etc.); ▸ Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties or drainage that could be affected by work in the floodplain; ▸ Planting plans for structural stormwater BMPs, including species, size, planting methods, and maintenance requirements of proposed planting
☐	☒	Logs of borings and/or test pit investigations along with supporting soils/geotechnical report and corresponding water tables
☐	☒	Mapping of any OLRSMM-approved remedial actions/systems (including ELURs)
☒	☐	Location of existing and proposed roads, buildings, and other structures including limits of disturbance; ▸ Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements; ▸ Location of existing and proposed conveyance systems, such as grass channels, swales, and storm drains, and location(s) of final discharge point(s) (wetland, waterbody, etc.); ▸ Cross sections of roadways, with edge details such as curbs and sidewalks; ▸ Location and dimensions of channel modifications, such as bridge or culvert crossings
☒	☐	Locations, cross sections, and profiles of all stream or wetland crossings and their method of stabilization

Appendix B – Minimum Standard 2 – Groundwater Recharge Calculations

- Recharge Summary and Calculations
- 1.2-inch Storm Event HydroCAD for Recharge BMPs

Project:	The Dunes	**Project #**	203208.0
Location:	Coventry, RI	**Sheet:**	1 **of** 1
Calculated By:	KC	**Date:**	9/28/2026
Checked By:	AC	**Date:**	10/01/2026
Title:	Groundwater Recharge		

Computations

Section 3.2.2 Minimum Standard 2: Groundwater Recharge (Re_v.)

- Re_v = X" * (F)*(I)/12

  Where:

  Re_v = required recharge volume (CF)

  F = Recharge Factors Based on Hydrologic Soil Group (HSG) from Table 3-4 of RISDISM (pg 3-11)

HSG	Recharge Factor (F)
A	0.60
B	0.35
C	0.25
D	0.10

  I = Total impervious area (SF) 13.9 AC = 601,433 SF

  X = 1" new impervious area

- Re_v = (1") * (601,433 SF) * 0.6 * 1/12 = 30,072 CF

- Recharge provided

DP 1	DP 2	DP 3	DP 4
INFL A: 3,120 CF	0 CF	0 CF	Depression 1: 122 CF
INFL B: 12,190 CF			
INFL C: 10,902 CF			
Infiltration Basin: 18,435 CF			
Depression 2: 1,011 CF			

TOTAL Provided: 45,780 CF

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DEP1: Depression 1 Peak Elev=284.00' Storage=5 cf Inflow=0.03 cfs 122 cf
Discarded=0.03 cfs 122 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 122 cf

Pond DEP2: Depression 2 Peak Elev=280.00' Storage=14 cf Inflow=0.28 cfs 1,011 cf
Discarded=0.28 cfs 1,011 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 1,011 cf

Pond IB: Infiltration Basin Peak Elev=263.86' Storage=5,698 cf Inflow=4.90 cfs 18,435 cf
Discarded=0.90 cfs 18,435 cf Primary=0.00 cfs 0 cf Outflow=0.90 cfs 18,435 cf

Pond UGINFL A: Underground Infil A Peak Elev=276.95' Storage=0.004 af Inflow=0.71 cfs 3,120 cf
Discarded=0.66 cfs 3,120 cf Primary=0.00 cfs 0 cf Outflow=0.66 cfs 3,120 cf

Pond UGINFL B: Underground Infl B Peak Elev=277.29' Storage=0.065 af Inflow=2.79 cfs 12,190 cf
Discarded=0.92 cfs 12,190 cf Primary=0.00 cfs 0 cf Outflow=0.92 cfs 12,190 cf

Pond UGINFL C: Underground Infil C Peak Elev=275.08' Storage=0.034 af Inflow=2.67 cfs 10,902 cf
Discarded=1.59 cfs 10,902 cf Primary=0.00 cfs 0 cf Outflow=1.59 cfs 10,902 cf

Appendix C – Minimum Standard 3 – Water Quality Calculations

› WQ Summary, Calculations and HydroCAD printouts for BMPs

Computations

Project:	Center of New England EG Home	**Project #**	203208.00
Location:	Coventry, RI	**Sheet:**	1 **of** 1
Calculated By:	KC	**Date:**	9/28/2026
Checked By:	AC	**Date:**	
Title:	Water Quality Volume (WQV)		

Section 3.2.3 Minimum Standard 3: Water Quality

- Required Stormwater Treatment Area = Impervious Surface = 13.8 AC

- Provided Stormwater Treatment Area:

UGINFL A: 0.87 AC
UGINFL B: 3.41 AC
UGINFL C: 3.80 ACF
Infiltration Basin: 5.41 AC
Depression 1 :0.034 AC
Depression 2 :0.283 AC

Total: 13.8 AC = WQV of 50,119 CF

Volume provided below outlet:

UGINFL A: 15,376 CF
UGINFL B: 58,850 CF CF
UGINFL C: 101,625 CF
Infiltration Basin: 19,817 CF
Depression 1 :9834 CF
Depression 2 :8,616 CF

Total vol. available for infiltration = 214,118 CF

Computations

Project:	The Dunes	Project #	203208.00
Location:	Coventry, RI	Sheet	1 of 1
Calculated by:	KC	Date:	9/28/2026
Checked by:	x	Date:	x
Title	Sediment Forebay		SFB 1

Section 6.4 Sediment Forebay

- As = 5,750 x Q

Where:

Q = Discharge from drainage area (CFS) = % WQV / 86,400 sec = 1 cfs

As = Sedimentation surface area (SF) = 46 sf

Area provided = 528 sf (> required 46 sf)

- The forebay shall be sized to contain a percent of the WQv as well as the required sediment volume.

Percent Required = 25%

Sediment Volume SV= {(76.6 x RA x TE) + (5.3 x DA x TE)} x T

RA = area of roadway or parking lots = 0.75 acres

TE = basin trap efficiency (80% standard)= 1%

DA = contributing land use area = 1.578 acres

T = time in years = 1 year(s)

SV = 1 cf

For % WQV refer to Chapter 5, for pretreatment requirements for each BMP used.

WQV % Required = 25%

WQV = 2722 cf

WQV Required = 681 cf

SV Required = 1 cf

Total volume required = 681 cf + 1 cf = 682 cf

Volume provided = 3916 cf (> required 682 cf)

Computations

Project:	The Dunes	Project #	203208.00
Location:	Coventry, RI	Sheet	1 of 1
Calculated by:	KC	Date:	9/28/2026
Checked by:	x	Date:	x
Title	Sediment Forebay		SFB 2

Section 6.4 Sediment Forebay

- As = 5,750 x Q

Where:

Q = Discharge from drainage area (CFS) = % WQV / 86,400 sec = 1 cfs

As = Sedimentation surface area (SF) = 25 sf

Area provided = 325 sf (> required 25 sf)

- The forebay shall be sized to contain a percent of the WQv as well as the required sediment volume.

Percent Required = 25%

Sediment Volume SV= {(76.6 x RA x TE) + (5.3 x DA x TE)} x T

RA = area of roadway or parking lots = 0.405 acres

TE = basin trap efficiency (80% standard)= 1%

DA = contributing land use area = 1.663 acres

T = time in years = 1 year(s)

SV = 1 cf

For % WQV refer to Chapter 5, for pretreatment requirements for each BMP used.

WQV % Required = 25%

WQV = 1470 cf

WQV Required = 368 cf

SV Required = 1 cf

Total volume required = 368 cf + 1 cf = 369 cf

Volume provided = 425 cf (> required 369 cf)

Summary for Pond DEP1: Depression 1

Inflow Area = 1.083 ac, 3.14% Impervious, Inflow Depth = 0.03" for 1.2" Runoff event
Inflow = 0.03 cfs @ 12.11 hrs, Volume= 0.003 af
Outflow = 0.03 cfs @ 12.15 hrs, Volume= 0.003 af, Atten= 8%, Lag= 2.5 min
Discarded = 0.03 cfs @ 12.15 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond DP4 : DP 4 Wetland E

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 284.00' @ 12.15 hrs Surf.Area= 2,027 sf Storage= 5 cf

Plug-Flow detention time= 2.9 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 2.9 min (787.1 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	284.00'	9,834 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
284.00	2,003	261.0	0	0	2,003
285.00	21,012	628.0	9,834	9,834	27,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	284.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	284.99'	**628.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.11 cfs @ 12.15 hrs HW=284.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=284.00' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Stage-Area-Storage for Pond DEP1: Depression 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
284.00	2,003	0
284.01	2,094	20
284.02	2,186	42
284.03	2,281	64
284.04	2,378	88
284.05	2,477	112
284.06	2,577	137
284.07	2,680	163
284.08	2,785	191
284.09	2,892	219
284.10	3,000	248
284.11	3,111	279
284.12	3,224	311
284.13	3,339	344
284.14	3,455	377
284.15	3,574	413
284.16	3,695	449
284.17	3,818	487
284.18	3,943	525
284.19	4,070	565
284.20	4,198	607
284.21	4,329	649
284.22	4,462	693
284.23	4,597	739
284.24	4,734	785
284.25	4,873	833
284.26	5,014	883
284.27	5,157	934
284.28	5,301	986
284.29	5,448	1,040
284.30	5,597	1,095
284.31	5,748	1,152
284.32	5,901	1,210
284.33	6,056	1,270
284.34	6,213	1,331
284.35	6,372	1,394
284.36	6,533	1,458
284.37	6,696	1,525
284.38	6,861	1,592
284.39	7,028	1,662
284.40	7,197	1,733
284.41	7,368	1,806
284.42	7,541	1,880
284.43	7,716	1,957
284.44	7,893	2,035
284.45	8,072	2,114
284.46	8,253	2,196
284.47	8,436	2,279
284.48	8,621	2,365
284.49	8,808	2,452
284.50	8,997	2,541
284.51	9,189	2,632
284.52	9,382	2,725
284.53	9,577	2,820
284.54	9,774	2,916
284.55	9,973	3,015
284.56	10,174	3,116
284.57	10,377	3,218
284.58	10,582	3,323
284.59	10,790	3,430
284.60	10,999	3,539
284.61	11,210	3,650
284.62	11,423	3,763
284.63	11,638	3,879
284.64	11,856	3,996
284.65	12,075	4,116
284.66	12,296	4,238
284.67	12,519	4,362
284.68	12,744	4,488
284.69	12,972	4,617
284.70	13,201	4,747
284.71	13,432	4,881
284.72	13,665	5,016
284.73	13,901	5,154
284.74	14,138	5,294
284.75	14,377	5,437
284.76	14,619	5,582
284.77	14,862	5,729
284.78	15,107	5,879
284.79	15,354	6,031
284.80	15,604	6,186
284.81	15,855	6,343
284.82	16,108	6,503
284.83	16,364	6,665
284.84	16,621	6,830
284.85	16,881	6,998
284.86	17,142	7,168
284.87	17,405	7,341
284.88	17,671	7,516
284.89	17,938	7,694
284.90	18,207	7,875
284.91	18,479	8,058
284.92	18,752	8,244
284.93	19,028	8,433
284.94	19,305	8,625
284.95	19,585	8,819
284.96	19,866	9,017
284.97	20,150	9,217
284.98	20,435	9,420
284.99	20,723	9,625
285.00	**21,012**	**9,834**

Summary for Pond DEP2: Depression 2

Inflow Area = 1.200 ac, 23.56% Impervious, Inflow Depth = 0.23" for 1.2" Runoff event
Inflow = 0.28 cfs @ 12.12 hrs, Volume= 0.023 af
Outflow = 0.28 cfs @ 12.14 hrs, Volume= 0.023 af, Atten= 1%, Lag= 0.9 min
Discarded = 0.28 cfs @ 12.14 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 280.00' @ 12.14 hrs Surf.Area= 6,642 sf Storage= 14 cf

Plug-Flow detention time= 0.9 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (785.6 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	8,616 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.00	6,634	461.0	0	0	6,634
281.00	10,763	577.0	8,616	8,616	16,230

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	280.99'	**40.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=1.27 cfs @ 12.14 hrs HW=280.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Stage-Area-Storage for Pond DEP2: Depression 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
280.00	6,634	0
280.01	6,670	67
280.02	6,707	133
280.03	6,743	201
280.04	6,780	268
280.05	6,817	336
280.06	6,854	405
280.07	6,891	473
280.08	6,928	542
280.09	6,965	612
280.10	7,002	682
280.11	7,040	752
280.12	7,077	823
280.13	7,115	893
280.14	7,152	965
280.15	7,190	1,037
280.16	7,228	1,109
280.17	7,266	1,181
280.18	7,304	1,254
280.19	7,342	1,327
280.20	7,380	1,401
280.21	7,419	1,475
280.22	7,457	1,549
280.23	7,496	1,624
280.24	7,534	1,699
280.25	7,573	1,775
280.26	7,612	1,851
280.27	7,651	1,927
280.28	7,690	2,004
280.29	7,729	2,081
280.30	7,768	2,158
280.31	7,808	2,236
280.32	7,847	2,314
280.33	7,887	2,393
280.34	7,926	2,472
280.35	7,966	2,551
280.36	8,006	2,631
280.37	8,046	2,712
280.38	8,086	2,792
280.39	8,126	2,873
280.40	8,166	2,955
280.41	8,207	3,037
280.42	8,247	3,119
280.43	8,288	3,202
280.44	8,328	3,285
280.45	8,369	3,368
280.46	8,410	3,452
280.47	8,451	3,536
280.48	8,492	3,621
280.49	8,533	3,706
280.50	8,574	3,792
280.51	8,616	3,878
280.52	8,657	3,964
280.53	8,699	4,051
280.54	8,740	4,138
280.55	8,782	4,226
280.56	8,824	4,314
280.57	8,866	4,402
280.58	8,908	4,491
280.59	8,950	4,580
280.60	8,992	4,670
280.61	9,034	4,760
280.62	9,077	4,851
280.63	9,119	4,942
280.64	9,162	5,033
280.65	9,205	5,125
280.66	9,248	5,217
280.67	9,291	5,310
280.68	9,334	5,403
280.69	9,377	5,496
280.70	9,420	5,590
280.71	9,463	5,685
280.72	9,507	5,780
280.73	9,550	5,875
280.74	9,594	5,971
280.75	9,638	6,067
280.76	9,681	6,163
280.77	9,725	6,261
280.78	9,769	6,358
280.79	9,813	6,456
280.80	9,858	6,554
280.81	9,902	6,653
280.82	9,946	6,752
280.83	9,991	6,852
280.84	10,036	6,952
280.85	10,080	7,053
280.86	10,125	7,154
280.87	10,170	7,255
280.88	10,215	7,357
280.89	10,260	7,459
280.90	10,305	7,562
280.91	10,351	7,666
280.92	10,396	7,769
280.93	10,442	7,874
280.94	10,487	7,978
280.95	10,533	8,083
280.96	10,579	8,189
280.97	10,625	8,295
280.98	10,671	8,401
280.99	10,717	8,508
281.00	**10,763**	**8,616**

Summary for Pond IB: Infiltration Basin

Inflow Area = 29.866 ac, 45.64% Impervious, Inflow Depth = 0.17" for 1.2" Runoff event
Inflow = 4.90 cfs @ 12.14 hrs, Volume= 0.423 af
Outflow = 0.90 cfs @ 12.66 hrs, Volume= 0.423 af, Atten= 82%, Lag= 31.0 min
Discarded = 0.90 cfs @ 12.66 hrs, Volume= 0.423 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond DP1 : DP1 off site north

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 263.86' @ 12.66 hrs Surf.Area= 16,057 sf Storage= 5,698 cf

Plug-Flow detention time= 45.4 min calculated for 0.423 af (100% of inflow)
Center-of-Mass det. time= 45.4 min (835.4 - 790.0)

Volume	Invert	Avail.Storage	Storage Description
#1	263.50'	78,050 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.50	15,398	604.0	0	0	15,398
264.00	16,311	613.0	7,926	7,926	16,321
265.00	22,709	720.0	19,422	27,348	27,691
267.00	28,088	734.0	50,702	78,050	29,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	263.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	264.65'	**36.0" Round Culvert X 2.00** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 264.65' / 261.00' S= 0.0652 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf

Discarded OutFlow Max=0.90 cfs @ 12.66 hrs HW=263.86' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.90 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=263.50' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Stage-Area-Storage for Pond IB: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
263.50	15,398	0
263.55	15,488	772
263.60	15,578	1,549
263.65	15,669	2,330
263.70	15,760	3,116
263.75	15,851	3,906
263.80	15,943	4,701
263.85	16,034	5,500
263.90	16,126	6,304
263.95	16,219	7,113
264.00	16,311	7,926
264.05	16,606	8,749
264.10	16,903	9,587
264.15	17,203	10,439
264.20	17,506	11,307
264.25	17,811	12,190
264.30	18,119	13,088
264.35	18,430	14,002
264.40	18,743	14,931
264.45	19,059	15,876
264.50	19,378	16,837
264.55	19,699	17,814
264.60	20,023	18,807
264.65	20,350	19,817
264.70	20,679	20,842
264.75	21,010	21,885
264.80	21,345	22,943
264.85	21,682	24,019
264.90	22,022	25,112
264.95	22,364	26,221
265.00	22,709	27,348
265.05	22,837	28,487
265.10	22,964	29,632
265.15	23,093	30,783
265.20	23,221	31,941
265.25	23,350	33,105
265.30	23,479	34,276
265.35	23,609	35,453
265.40	23,739	36,637
265.45	23,869	37,827
265.50	24,000	39,024
265.55	24,131	40,227
265.60	24,263	41,437
265.65	24,395	42,654
265.70	24,527	43,877
265.75	24,659	45,106
265.80	24,792	46,342
265.85	24,925	47,585
265.90	25,059	48,835
265.95	25,193	50,091
266.00	25,327	51,354
266.05	25,462	52,624
266.10	25,597	53,900
266.15	25,732	55,184
266.20	25,868	56,474
266.25	26,004	57,770
266.30	26,140	59,074
266.35	26,277	60,385
266.40	26,414	61,702
266.45	26,552	63,026
266.50	26,690	64,357
266.55	26,828	65,695
266.60	26,967	67,040
266.65	27,105	68,392
266.70	27,245	69,750
266.75	27,384	71,116
266.80	27,524	72,489
266.85	27,665	73,869
266.90	27,805	75,255
266.95	27,947	76,649
267.00	**28,088**	**78,050**
267.05	28,088	78,050
267.10	28,088	78,050
267.15	28,088	78,050
267.20	28,088	78,050
267.25	28,088	78,050
267.30	28,088	78,050
267.35	28,088	78,050
267.40	28,088	78,050
267.45	28,088	78,050
267.50	28,088	78,050
267.55	28,088	78,050
267.60	28,088	78,050
267.65	28,088	78,050

Summary for Pond SFB1: SFB1

Inflow Area = 1.578 ac, 47.53% Impervious, Inflow Depth = 0.47" for 1.2" Runoff event
Inflow = 0.82 cfs @ 12.08 hrs, Volume= 0.062 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond UGINFL C : Underground Infil C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 281.11' @ 24.34 hrs Surf.Area= 1,622 sf Storage= 2,684 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	9,927 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
278.50	532	116.0	0	0	532
284.00	3,515	237.0	9,927	9,927	4,067

Device	Routing	Invert	Outlet Devices
#1	Primary	281.80'	**15.0" Round Culvert** L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 281.80' / 278.20' S= 0.0263 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=278.50' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Stage-Area-Storage for Pond SFB1: SFB1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
278.50	532	0
278.60	563	55
278.70	594	113
278.80	627	174
278.90	660	238
279.00	695	306
279.10	730	377
279.20	766	452
279.30	803	530
279.40	841	612
279.50	879	698
279.60	919	788
279.70	959	882
279.80	1,000	980
279.90	1,042	1,082
280.00	1,085	1,189
280.10	1,129	1,299
280.20	1,174	1,414
280.30	1,219	1,534
280.40	1,266	1,658
280.50	1,313	1,787
280.60	1,361	1,921
280.70	1,410	2,060
280.80	1,460	2,203
280.90	1,511	2,352
281.00	1,563	2,505
281.10	1,615	2,664
281.20	1,668	2,828
281.30	1,723	2,998
281.40	1,778	3,173
281.50	1,834	3,353
281.60	1,891	3,540
281.70	1,948	3,732
281.80	2,007	3,929
281.90	2,066	4,133
282.00	2,127	4,343
282.10	2,188	4,558
282.20	2,250	4,780
282.30	2,313	5,008
282.40	2,377	5,243
282.50	2,441	5,484
282.60	2,507	5,731
282.70	2,573	5,985
282.80	2,640	6,246
282.90	2,708	6,513
283.00	2,777	6,788
283.10	2,847	7,069
283.20	2,918	7,357
283.30	2,990	7,652
283.40	3,062	7,955
283.50	3,135	8,265
283.60	3,210	8,582
283.70	3,285	8,907
283.80	3,361	9,239
283.90	3,437	9,579
284.00	**3,515**	**9,927**

Summary for Pond SFB2: SFB 2

Inflow Area = 1.663 ac, 24.34% Impervious, Inflow Depth = 0.24" for 1.2" Runoff event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.4 min
Primary = 0.44 cfs @ 12.09 hrs, Volume= 0.023 af
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 264.03' @ 12.09 hrs Surf.Area= 540 sf Storage= 440 cf

Plug-Flow detention time= 156.1 min calculated for 0.023 af (71% of inflow)
Center-of-Mass det. time= 65.2 min (847.2 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	1,090 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	325	76.0	0	0	325
264.00	533	91.0	425	425	541
265.00	807	111.0	665	1,090	878

Device	Routing	Invert	Outlet Devices
#1	Primary	264.00'	**35.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=264.03' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.42 cfs @ 0.43 fps)

Stage-Area-Storage for Pond SFB2: SFB 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
263.00	325	0
263.02	329	7
263.04	332	13
263.06	336	20
263.08	340	27
263.10	343	33
263.12	347	40
263.14	351	47
263.16	355	54
263.18	359	62
263.20	363	69
263.22	366	76
263.24	370	83
263.26	374	91
263.28	378	98
263.30	382	106
263.32	386	114
263.34	390	121
263.36	394	129
263.38	398	137
263.40	402	145
263.42	406	153
263.44	410	161
263.46	414	170
263.48	418	178
263.50	423	186
263.52	427	195
263.54	431	203
263.56	435	212
263.58	439	221
263.60	444	230
263.62	448	239
263.64	452	248
263.66	457	257
263.68	461	266
263.70	465	275
263.72	470	284
263.74	474	294
263.76	478	303
263.78	483	313
263.80	487	323
263.82	492	333
263.84	496	342
263.86	501	352
263.88	505	362
263.90	510	373
263.92	514	383
263.94	519	393
263.96	524	404
263.98	528	414
264.00	533	425
264.02	538	435
264.04	543	446
264.06	548	457
264.08	553	468
264.10	558	479
264.12	563	490
264.14	568	502
264.16	573	513
264.18	578	525
264.20	583	536
264.22	588	548
264.24	594	560
264.26	599	572
264.28	604	584
264.30	609	596
264.32	615	608
264.34	620	621
264.36	625	633
264.38	630	646
264.40	636	658
264.42	641	671
264.44	647	684
264.46	652	697
264.48	657	710
264.50	663	723
264.52	668	736
264.54	674	750
264.56	679	763
264.58	685	777
264.60	691	791
264.62	696	805
264.64	702	819
264.66	707	833
264.68	713	847
264.70	719	861
264.72	725	876
264.74	730	890
264.76	736	905
264.78	742	920
264.80	748	935
264.82	754	950
264.84	759	965
264.86	765	980
264.88	771	995
264.90	777	1,011
264.92	783	1,026
264.94	789	1,042
264.96	795	1,058
264.98	801	1,074
265.00	**807**	**1,090**

Summary for Pond UGINFL A: Underground Infil A

Inflow Area = 78,487 sf, 48.39% Impervious, Inflow Depth = 0.48" for 1.2" Runoff event
Inflow = 0.71 cfs @ 12.22 hrs, Volume= 3,120 cf
Outflow = 0.66 cfs @ 12.27 hrs, Volume= 3,120 cf, Atten= 7%, Lag= 3.5 min
Discarded = 0.66 cfs @ 12.27 hrs, Volume= 3,120 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond UGINFL B : Underground Infl B

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.95' @ 12.27 hrs Surf.Area= 3,840 sf Storage= 158 cf

Plug-Flow detention time= 4.0 min calculated for 3,119 cf (100% of inflow)
Center-of-Mass det. time= 4.0 min (795.5 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	276.90'	0 cf	**48.00'W x 80.00'L x 5.17'H Field A** 19,840 cf Overall - 19,840 cf Embedded = 0 cf x 33.0% Voids
#2A	276.90'	15,380 cf	**retain_it upright 4.5'** x 60 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 6 Rows adjusted for 287.0 cf perimeter wall
		15,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	276.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	280.60'	**8.0" Round Culvert** L= 146.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 280.60' / 279.60' S= 0.0068 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.74 cfs @ 12.27 hrs HW=276.95' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=276.90' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Stage-Area-Storage for Pond UGINFL A: Underground Infil A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
276.90	**3,840**	0
277.00	3,840	342
277.10	3,840	684
277.20	3,840	1,025
277.30	3,840	1,367
277.40	3,840	1,709
277.50	3,840	2,051
277.60	3,840	2,392
277.70	3,840	2,734
277.80	3,840	3,076
277.90	3,840	3,418
278.00	3,840	3,759
278.10	3,840	4,101
278.20	3,840	4,443
278.30	3,840	4,785
278.40	3,840	5,127
278.50	3,840	5,468
278.60	3,840	5,810
278.70	3,840	6,152
278.80	3,840	6,494
278.90	3,840	6,835
279.00	3,840	7,177
279.10	3,840	7,519
279.20	3,840	7,861
279.30	3,840	8,202
279.40	3,840	8,544
279.50	3,840	8,886
279.60	3,840	9,228
279.70	3,840	9,570
279.80	3,840	9,911
279.90	3,840	10,253
280.00	3,840	10,595
280.10	3,840	10,937
280.20	3,840	11,278
280.30	3,840	11,620
280.40	3,840	11,962
280.50	3,840	12,304
280.60	3,840	12,645
280.70	3,840	12,987
280.80	3,840	13,329
280.90	3,840	13,671
281.00	3,840	14,013
281.10	3,840	14,354
281.20	3,840	14,696
281.30	3,840	15,038
281.40	3,840	15,380
281.50	3,840	15,380
281.60	3,840	15,380
281.70	3,840	15,380
281.80	3,840	15,380
281.90	3,840	15,380
282.00	3,840	**15,380**

Summary for Pond UGINFL B: Underground Infl B

Inflow Area = 343,323 sf, 54.29% Impervious, Inflow Depth = 0.43" for 1.2" Runoff event
Inflow = 2.79 cfs @ 12.20 hrs, Volume= 12,190 cf
Outflow = 0.92 cfs @ 12.05 hrs, Volume= 12,190 cf, Atten= 67%, Lag= 0.0 min
Discarded = 0.92 cfs @ 12.05 hrs, Volume= 12,190 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond UGINFL C : Underground Infil C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 277.29' @ 12.62 hrs Surf.Area= 16,512 sf Storage= 2,820 cf

Plug-Flow detention time= 22.9 min calculated for 12,190 cf (100% of inflow)
Center-of-Mass det. time= 22.9 min (813.7 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	277.10'	0 cf	**48.00'W x 344.00'L x 4.67'H Field A** 77,056 cf Overall - 77,056 cf Embedded = 0 cf x 33.0% Voids
#2A	277.10'	58,843 cf	**retain_it upright 4.0'** x 258 Inside #1 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 56.0"H => 37.33 sf x 8.00'L = 298.7 cf 6 Rows adjusted for 739.8 cf perimeter wall
		58,843 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.10'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	280.10'	**10.0" Round Culvert** L= 166.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 280.10' / 278.10' S= 0.0120 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.92 cfs @ 12.05 hrs HW=277.15' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=277.10' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Stage-Area-Storage for Pond UGINFL B: Underground Infl B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
277.10	**16,512**	0
277.15	16,512	736
277.20	16,512	1,471
277.25	16,512	2,207
277.30	16,512	2,942
277.35	16,512	3,678
277.40	16,512	4,413
277.45	16,512	5,149
277.50	16,512	5,884
277.55	16,512	6,620
277.60	16,512	7,355
277.65	16,512	8,091
277.70	16,512	8,826
277.75	16,512	9,562
277.80	16,512	10,297
277.85	16,512	11,033
277.90	16,512	11,769
277.95	16,512	12,504
278.00	16,512	13,240
278.05	16,512	13,975
278.10	16,512	14,711
278.15	16,512	15,446
278.20	16,512	16,182
278.25	16,512	16,917
278.30	16,512	17,653
278.35	16,512	18,388
278.40	16,512	19,124
278.45	16,512	19,859
278.50	16,512	20,595
278.55	16,512	21,330
278.60	16,512	22,066
278.65	16,512	22,801
278.70	16,512	23,537
278.75	16,512	24,273
278.80	16,512	25,008
278.85	16,512	25,744
278.90	16,512	26,479
278.95	16,512	27,215
279.00	16,512	27,950
279.05	16,512	28,686
279.10	16,512	29,421
279.15	16,512	30,157
279.20	16,512	30,892
279.25	16,512	31,628
279.30	16,512	32,363
279.35	16,512	33,099
279.40	16,512	33,834
279.45	16,512	34,570
279.50	16,512	35,306
279.55	16,512	36,041
279.60	16,512	36,777
279.65	16,512	37,512
279.70	16,512	38,248
279.75	16,512	38,983
279.80	16,512	39,719
279.85	16,512	40,454
279.90	16,512	41,190
279.95	16,512	41,925
280.00	16,512	42,661
280.05	16,512	43,396
280.10	16,512	44,132
280.15	16,512	44,867
280.20	16,512	45,603
280.25	16,512	46,339
280.30	16,512	47,074
280.35	16,512	47,810
280.40	16,512	48,545
280.45	16,512	49,281
280.50	16,512	50,016
280.55	16,512	50,752
280.60	16,512	51,487
280.65	16,512	52,223
280.70	16,512	52,958
280.75	16,512	53,694
280.80	16,512	54,429
280.85	16,512	55,165
280.90	16,512	55,900
280.95	16,512	56,636
281.00	16,512	57,371
281.05	16,512	58,107
281.10	16,512	58,843
281.15	16,512	58,843
281.20	16,512	58,843
281.25	16,512	58,843
281.30	16,512	58,843
281.35	16,512	58,843
281.40	16,512	58,843
281.45	16,512	58,843
281.50	16,512	58,843
281.55	16,512	58,843
281.60	16,512	58,843
281.65	16,512	58,843
281.70	16,512	58,843
281.75	16,512	**58,843**

Summary for Pond UGINFL C: Underground Infil C

Inflow Area = 699,224 sf, 50.31% Impervious, Inflow Depth = 0.19" for 1.2" Runoff event
Inflow = 2.67 cfs @ 12.14 hrs, Volume= 10,902 cf
Outflow = 1.59 cfs @ 12.14 hrs, Volume= 10,902 cf, Atten= 41%, Lag= 0.0 min
Discarded = 1.59 cfs @ 12.14 hrs, Volume= 10,902 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 275.08' @ 12.34 hrs Surf.Area= 28,416 sf Storage= 1,488 cf

Plug-Flow detention time= 11.6 min calculated for 10,900 cf (100% of inflow)
Center-of-Mass det. time= 11.6 min (798.5 - 787.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	275.00'	0 cf	**96.00'W x 224.00'L x 4.67'H Field A** 100,352 cf Overall - 100,352 cf Embedded = 0 cf x 33.0% Voids
#2A	275.00'	76,992 cf	**retain_it upright 4.0'** x 336 Inside #1 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 56.0"H => 37.33 sf x 8.00'L = 298.7 cf 12 Rows adjusted for 604.0 cf perimeter wall
#3B	275.00'	0 cf	**96.00'W x 72.00'L x 5.33'H Field B** 36,864 cf Overall - 36,864 cf Embedded = 0 cf x 33.0% Voids
#4B	275.00'	24,624 cf	**retain_it inverted 4.0'** x 108 Inside #3 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 64.0"H => 42.67 sf x 8.00'L = 341.3 cf 12 Rows adjusted for 317.1 cf perimeter wall
		101,616 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	275.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	277.80'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 277.80' / 277.00' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=1.59 cfs @ 12.14 hrs HW=275.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.59 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Stage-Area-Storage for Pond UGINFL C: Underground Infil C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
275.00	**28,416**	0
275.10	28,416	1,925
275.20	28,416	3,850
275.30	28,416	5,774
275.40	28,416	7,699
275.50	28,416	9,624
275.60	28,416	11,549
275.70	28,416	13,679
275.80	28,416	16,219
275.90	28,416	18,760
276.00	28,416	21,300
276.10	28,416	23,840
276.20	28,416	26,381
276.30	28,416	28,921
276.40	28,416	31,462
276.50	28,416	34,002
276.60	28,416	36,542
276.70	28,416	39,083
276.80	28,416	41,623
276.90	28,416	44,164
277.00	28,416	46,704
277.10	28,416	49,244
277.20	28,416	51,785
277.30	28,416	54,325
277.40	28,416	56,866
277.50	28,416	59,406
277.60	28,416	61,946
277.70	28,416	64,487
277.80	28,416	67,027
277.90	28,416	69,568
278.00	28,416	72,108
278.10	28,416	74,648
278.20	28,416	77,189
278.30	28,416	79,729
278.40	28,416	82,270
278.50	28,416	84,810
278.60	28,416	87,350
278.70	28,416	89,891
278.80	28,416	92,431
278.90	28,416	94,972
279.00	28,416	97,512
279.10	28,416	98,128
279.20	28,416	98,743
279.30	28,416	99,359
279.40	28,416	99,974
279.50	28,416	100,590
279.60	28,416	**101,206**
279.70	28,416	**101,616**
279.80	28,416	101,616
279.90	28,416	101,616
280.00	28,416	101,616
280.10	28,416	101,616
280.20	28,416	101,616
280.30	28,416	101,616

Rhode Island Department of Environmental Management

Office of Water Resources – Stormwater Technology Review Committee

235 Promenade St. Providence, RI 02908 Ph: 401-222-4700

Alternative Stormwater Technology Certification

Vendor Contact:
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Director of Stormwater Management - East
Contech Engineered Solutions, LLC
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Derek.berg@contechllc.com
www.conteches.com
Ph: 207-885-6174

Technology Name:
Cascade Separator®

Approval Type:
Pretreatment/Retrofits

Certification Dates:
Issued: October 12, 2021
Revised: May 25, 2022
Expires: October 12, 2026

CERTIFICATION:

The Rhode Island Stormwater Technology Review Committee which consists of members from the Department of Environmental Management (DEM), Department of Transportation (DOT) and the Coastal Resources Management Council (CRMC) have reviewed the **Cascade Separator®** application for certification of its Technology Approval and accepted use for Stormwater Treatment in the State of Rhode Island.

In accordance with Stormwater Rule 250-RICR-150-10-8.9B, **Contech Engineered Solutions, LLC** has petitioned the permitting agencies to certify the **Cascade Separator®** as an acceptable structural stormwater control described in Stormwater Rule 250-RICR-150-10-8.31. They have submitted monitoring results and supporting information developed in accordance with the provisions of the Technology Assessment Protocol (TAP) for Innovative and Emerging Technologies as described in in Stormwater Rule 250-RICR-150-10 Sections 8.39 and 8.40.

The **Cascade Separator®** is granted reciprocity in Rhode Island as a proprietary stormwater treatment technology, given that it has been issued an MTD (manufactured treatment device) Lab Certification from the New Jersey Department of Environmental Protection (NJDEP) effective October 1, 2019 as a result of the *NJCAT Technology Verification – Cascade Separator®* study from April 2019, performed by Contech's laboratory in Portland, Oregon, with independent third-party observation provided by Dr. Scott Wells and Dr. Chris Berger from Portland State University. The study was conducted in accordance with the NJDEP "Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" from January 2013. This NJDEP MTD Lab Certification recognizes the **Cascade Separator®** as a stormwater treatment technology which provides 50% removal of total suspended solids when operating at the maximum treatment flow rate for each device specified in the attached *Table 1: RIDEM Approved Cascade Separator Sizing Table for 50% TSS Removal.* The State of New Jersey is a member of the Technology Acceptance Reciprocity Partnership (TARP), which allows for reciprocity consideration in Rhode Island.

The **Cascade Separator®** is a pre-treatment or retrofit device that captures TSS from stormwater runoff as described in Stormwater Rule 250-RICR-150-10-8.31. It is a vertically oriented cylindrical structure manufactured from pre-cast reinforced concrete and fiber reinforced plastic, designed to remove trash and sediment from stormwater. This product was developed by **Contech Engineered Solutions, LLC**. The **Cascade Separator®** is approved for online and off-line use.

The manufacturer has demonstrated that this product meets the minimum water quality standards for pretreatment as described in Stormwater Rule 250-RICR-150-10-8.31. The **Cascade Separator®** is approved for **50%** removal of total suspended solids (TSS) when designed using flow rates specified in the attached *Table 1:*

RIDEM Approved Sizing for Cascade Separator®. The **Cascade Separator®** is NOT recognized for removal of Pathogens, Total Phosphorus or Nitrogen. This device may be used as an approved pre-treatment or retrofit device provided that the design, installation, and maintenance are conducted in accordance with the following terms and conditions:

I. GENERAL CERTIFICATION REQUIREMENTS

1. The system must be designed and installed to adhere to the manufacturer's specifications titled "Cascade Separator General Specification" which can be found on at: https://www.conteches.com/technical-guides/search?filter=QL31JT8LA0

2. The **Cascade Separator®** is **certified as a pretreatment** device in accordance with Stormwater Rule 250-RICR-150-10-8.31, provided the device treats the flow of the first inch of runoff from the capture area, unless waived by the state permitting agency.

3. The applicant must provide the RI specific manufacturers design sheet for Departmental review or provide the manufacturer's review approval. All units that capture greater than one acre of impervious cover must be reviewed by the manufacturer.

4. This device is **certified as a retrofit device** in accordance with Stormwater Rule 250-RICR-150-10-8.6A. Retrofits are allowed flexibility with regards to the eleven minimum standards described in Sections 8.6 through 8.17 of Stormwater Rule 250-RICR-150-10, but in general they are considered effective if they capture at least 50% of the catchment and meet the target water quality treatment of at least the first 0.5 inches of the water quality volume.

5. The approved devices shall be located such that they are accessible for maintenance and/or emergency removal of oil or chemical spills.

6. The device cannot be used in series with another Hydrodynamic separator to achieve enhanced removal rates for TSS.

II. MAINTENANCE REQUIREMENTS

1. Standard permitting conditions for inclusion of this technology will, at a minimum include the following:

    a. Each individual owner must ensure that any and all of their proprietary stormwater treatment devices are maintained in accordance with the manufacturer's specifications, which are provided in the **Cascade Separator®** Inspection and Maintenance Guide. https://www.conteches.com/Portals/0/Documents/Maintenance%20Guides/Cascade-Maintenance%20Guide.pdf?ver=2018-11-05-093254-300

    b. Each individual owner must ensure that any and all of their proprietary stormwater pre-treatment devices are maintained in accordance with the requirements stated in Stormwater Rule 250-RICR-150-10-8.31-C, which requires the sump to be inspected a minimum of 2 times per year. Additionally, the device must be cleaned out when either pollutant removal capacity is reduced by 50% or more, or when 50% or more of the device's pollutant storage capacity is filled or displaced.

    c. All material removed from the unit must be properly disposed of and is the responsibility of the owner.

d. The applicant must include a copy of the **Cascade Separator®** Inspection and Maintenance Guide in their project specific long term operation and maintenance plan.

2. The applicant must provide evidence of a maintenance contract which extends for a minimum of two years. The contracted maintenance provider must receive training by **Contech Engineered Solutions, LLC** on how to properly maintain **Cascade Separator®** devices. This requirement excludes maintenance providers recognized by the RIDEM to be qualified in maintenance of **Cascade Separator®** devices.

III. REPORTING REQUIREMENTS

1. Upon request from the owner of any Cascade Separator system installed in the State of Rhode Island, the vendor shall provide the owner with a recommended maintenance schedule after the first year of operation. If a recommended maintenance schedule is requested by the owner after the first year of the device's operation, then the owner is responsible for notifying the vendor of any additional pollutant loads on sites where contributing drainage areas may be subject to further development.

2. The Vendor shall provide a listing to the RIDEM Office of Water Resources of all systems installed within the State of Rhode Island on an annual basis.

3. The Vendor shall provide an annual listing to the RIDEM Office of Water Resources of all Rhode Island maintenance providers that they trained in **Cascade Separator®** maintenance.

4. The Vendor shall immediately notify the RIDEM Office of Water Resources if and when any changes are made to the model name or number of any **Cascade Separator®** device for all models applicable to this certification.

5. The Vendor shall immediately notify the RIDEM Office of Water Resources if and when any revisions are made to the design, installation operation and maintenance manuals for all models applicable to this certification. Revisions deemed by the RIDEM to be substantial, may require re-application to the Alternative Stormwater Technology Program.

6. The Vendor shall notify the RIDEM at least thirty (30) days following any proposed transfer of ownership of the Component technology. Notification shall include the name and address of the new owner and a written agreement between the existing and new owner specifying a date for transfer of ownership, responsibility, and liability for the Component. All provisions of this Certification shall be applicable to any new owners.

IV. RIGHTS OF THE RIDEM AND CRMC

1. The RIDEM may suspend, modify, or revoke this approval for cause, including but not limited to non-compliance with any of the conditions or provisions of this approval, mis-representation, or failure to fully disclose all relevant data, or receipt of new information indicating that the use of the **Cascade Separator®** system is contrary to the public interest, public health, or the environment.

2. This approval does not represent an endorsement of the **Cascade Separator®** system by the RIDEM, RIDOT or CRMC. This letter of approval may be reproduced only in its entirety.

3. The **Cascade Separator®** General Specification and **Cascade Separator®** Inspection and Maintenance Guide referenced herein are approved upon the date of approval of this Certification.

4. The RIDEM reserves the right to suspend or revoke this Certification if updated design, installation, and O&M manuals are not provided to the RIDEM within thirty (30) days of RIDEM request or one hundred and eighty (180) days prior to the expiration date of this Certification. All revisions must be reviewed and approved by the RIDEM prior to re-certification.

Eric A. Beck, P.E. Date
Administrator of Groundwater and Wetlands Protection
RIDEM

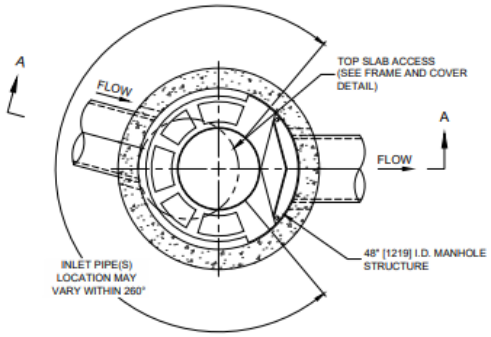
ATTACHMENTS

Table 1: RIDEM Approved Cascade Separator Sizing Table for 50% TSS Removal

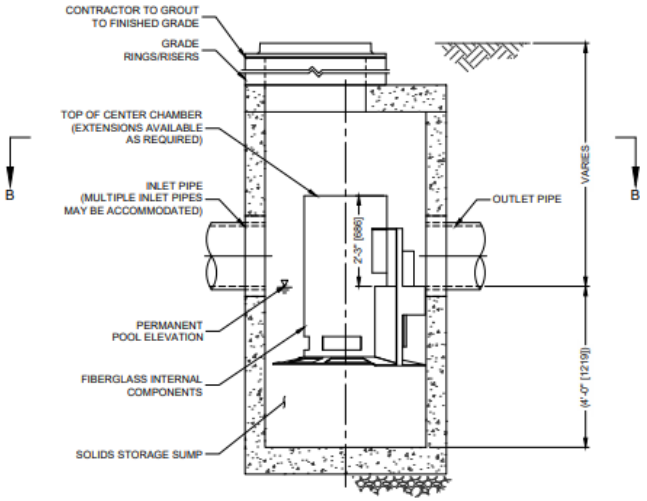
Model #	Water Quality Flow Rate (cfs)	Approximate Impervious Treatment Area (acres)
CS-3	1.02	0.93
CS-4	1.80	1.68
CS-5	2.81	2.63
CS-6	4.05	3.78
CS-8	7.20	6.73
CS-10	11.3	10.56
CS-12	16.2	15.14

Table 2: Standard Sediment Storage Capacity of Cascade Separator® Devices

Model #	Structure Inside Diameter (ft)	Sediment Storage Volume (ft^3)
CS-4	4	18.9
CS-5	5	29.4
CS-6	6	42.4
CS-8	8	75.3
CS-10	10	117.7
CS-12	12	169.6



PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

CASCADE separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-4 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES / SPECIAL REQUIREMENTS:			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH Engineered Solutions LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CS-4
CASCADE SEPARATOR
STANDARD DETAIL

I:\COMMON\CAD\TREATMENT\21 CASCADE\40 STANDARD DRAWINGS\DWG\CS-4-DTL.DWG 1/22/2019 9:34 AM

To: File

Date: September 3, 2026

Project #: 202308

From: Karen Crawford

Re: The Dunes
Coventry, RI
Mounding Analysis

Introduction

This memorandum has been prepared to describe the compliance of the infiltration systems proposed as part of the stormwater management system at the above referenced site with the Rhode Island Department of Environmental Management Rules and Regulations 250-RICR-150-10-8 - 8.21.B.8 that requires mounding analysis where separation to groundwater is less than 4-feet and retention of the 10-year storm is provided. Details of the mounding analysis, including assumptions and findings, are provided herein.

Mounding Analysis Methodology

A mounding analysis was performed using the Hantush method (1967) to evaluate the temporary rise in the groundwater elevation below the infiltration basins following a storm event. Soil properties were selected using the results of on-site evaluations and literature values as described in the Assumptions section of this memorandum. The input parameters for the model were determined as follows:

Assumptions

The following assumptions were used in the preparation of the groundwater model. These were established based on site investigations:

- Soils are generally classified as sandy loam.
- Seasonal High Groundwater and separation distance as noted in Appendix A, table 5.3.
- Specific yield of the soil is 0.25, based on the literature range for sandy loam[1]. Mounding analysis is insensitive to changes in specific yield acceptable ranges therefore the use of literature values is warranted.
- Saturated zone was determined using USGS Bedrock Contour mapping. Please see attached Figure 1. Refusal depth across the site was estimated to be at elevation 300 therefore the initial thickness of the saturated zone varies from 21.8' to 24.1'.

[1] Johnson, A.I. *Specific Yield-Compilation of Specific Yields for Various Materials*. Hydrologic Properties of Earth Materials; Geological Survey Water-Supply Paper 1662-D.

The following conclusions have been determined from VHB's mounding analysis:

- The temporary water table rise will reach to the noted elevations below at the center of the system.

  Underground Infl A water table rise to elevation 279.1
  Underground Infl B water table rise to elevation 280.0
  Underground Infl C water table rise to elevation 281.5

- The groundwater mound that forms under the center of the infiltration systems will not break out above the ground surface.

Underground Infil B

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Input Values		
4.8200	*R*	**Recharge (infiltration) rate (feet/day)**
0.280	Sy	**Specific yield, Sy (dimensionless, between 0 and 1)**
48.20	K	**Horizontal hydraulic conductivity, Kh (feet/day)***
180.000	x	**1/2 length of basin (x direction, in feet)**
24.000	y	**1/2 width of basin (y direction, in feet)**
1.040	t	**duration of infiltration period (days)**
24.100	hi(0)	**initial thickness of saturated zone (feet)**

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

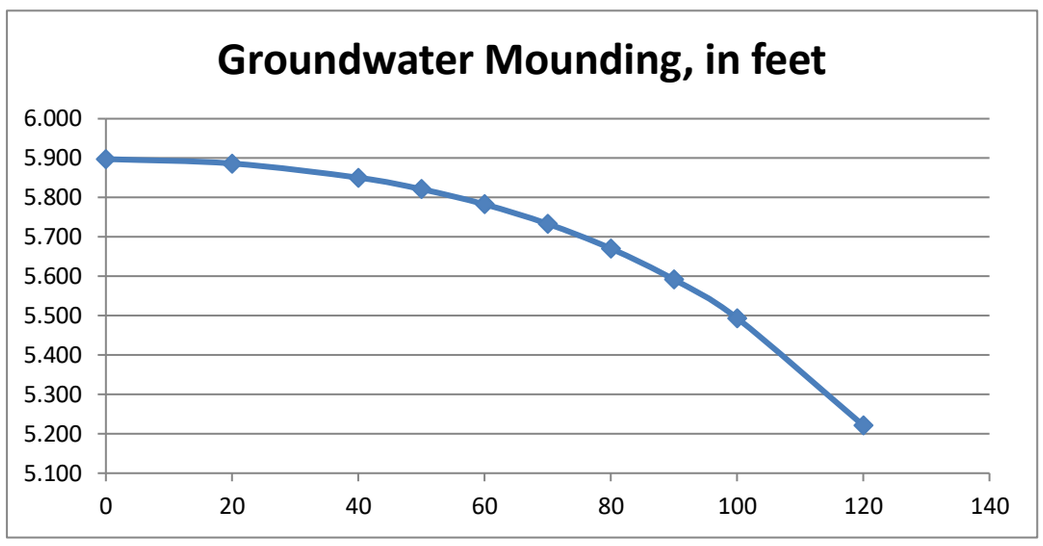
hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

29.997	h(max)	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.897	Δh(max)	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.897	0
5.886	20
5.850	40
5.821	50
5.783	60
5.733	70
5.670	80
5.592	90
5.494	100
5.221	120

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Underground Infil A

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
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use consistent units (e.g. feet & days **or** inches & hours)

Input Values		
16.5400	***R***	**Recharge (infiltration) rate (feet/day)**
0.280	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
165.40	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
44.000	**x**	**1/2 length of basin (x direction, in feet)**
24.000	**y**	**1/2 width of basin (y direction, in feet)**
1.000	**t**	**duration of infiltration period (days)**
23.900	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

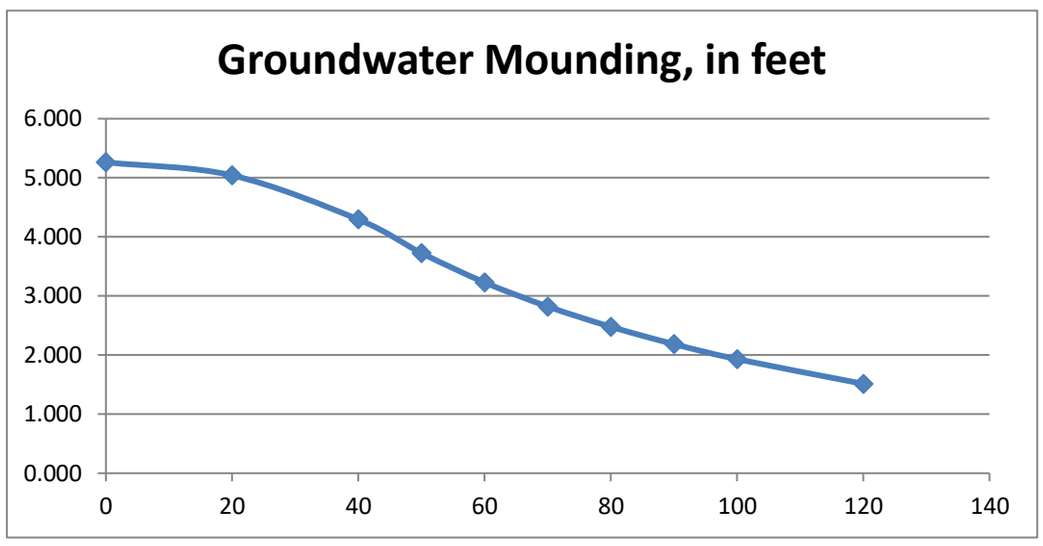
hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

29.162	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.262	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.262	0
5.041	20
4.294	40
3.726	50
3.229	60
2.821	70
2.478	80
2.185	90
1.931	100
1.513	120

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Underground Infil C

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
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use consistent units (e.g. feet & days **or** inches & hours)

Input Values		
4.8200	***R***	**Recharge (infiltration) rate (feet/day)**
0.280	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
48.20	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
112.000	**x**	**1/2 length of basin (x direction, in feet)**
48.000	**y**	**1/2 width of basin (y direction, in feet)**
1.080	**t**	**duration of infiltration period (days)**
21.800	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

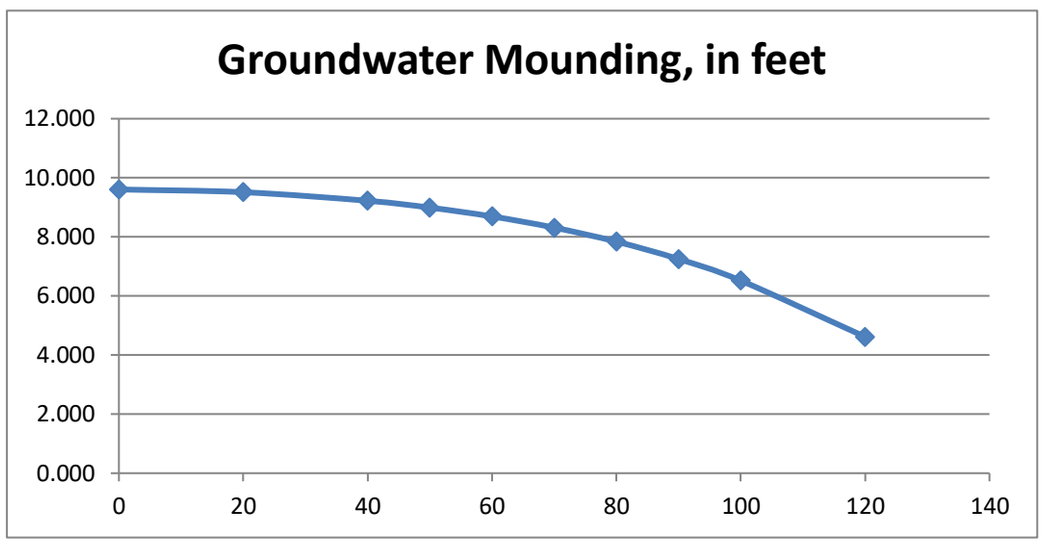
hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

31.404	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
9.604	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
9.604	**0**
9.512	**20**
9.221	**40**
8.990	**50**
8.691	**60**
8.312	**70**
7.838	**80**
7.249	**90**
6.518	**100**
4.617	**120**

Re-Calculate Now



Disclaimer

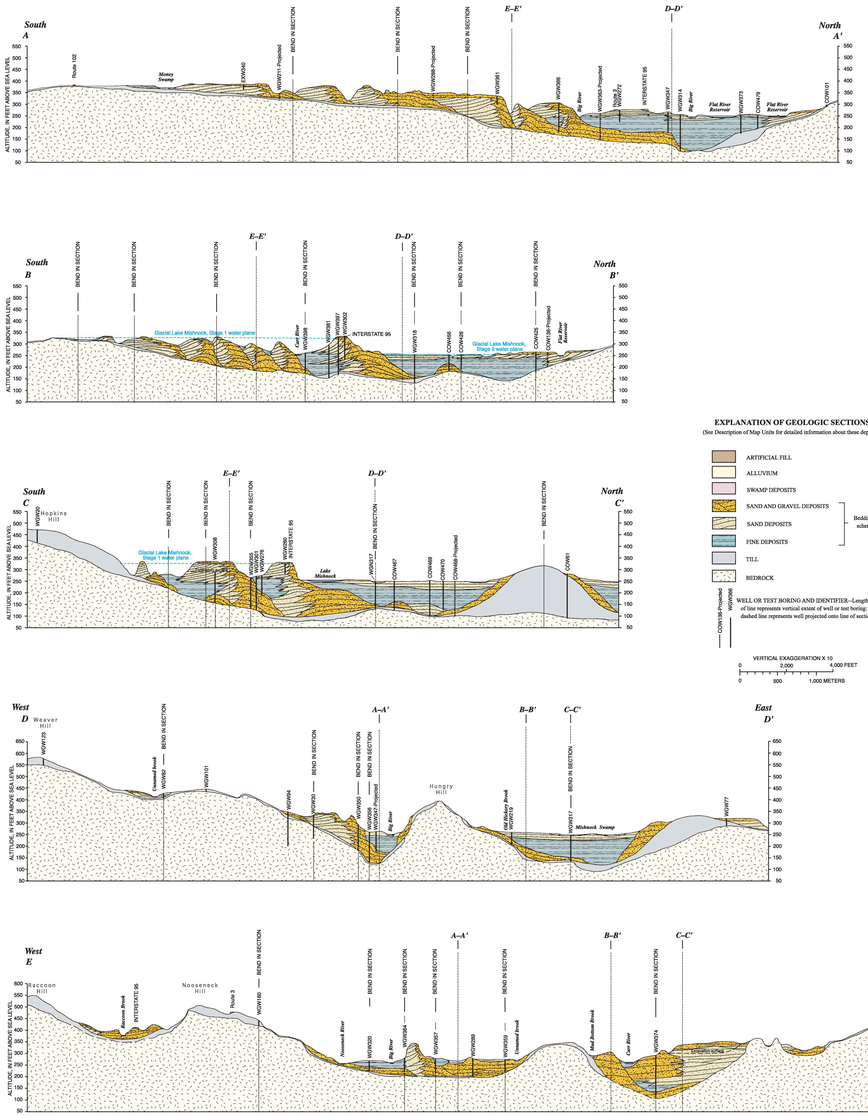
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U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
RHODE ISLAND WATER RESOURCES BOARD

WATER-RESOURCES INVESTIGATIONS REPORT 01-4169
Glacial geology and aquifer characteristics of the Big River area, central Rhode Island – PLATE
Stone, J.R., and Dickerman, D.C., 2002
Surficial materials map of the Big River area

Geologic Sections



EXPLANATION OF GEOLOGIC SECTIONS

(See Description of Map Units for detailed information about these deposits)

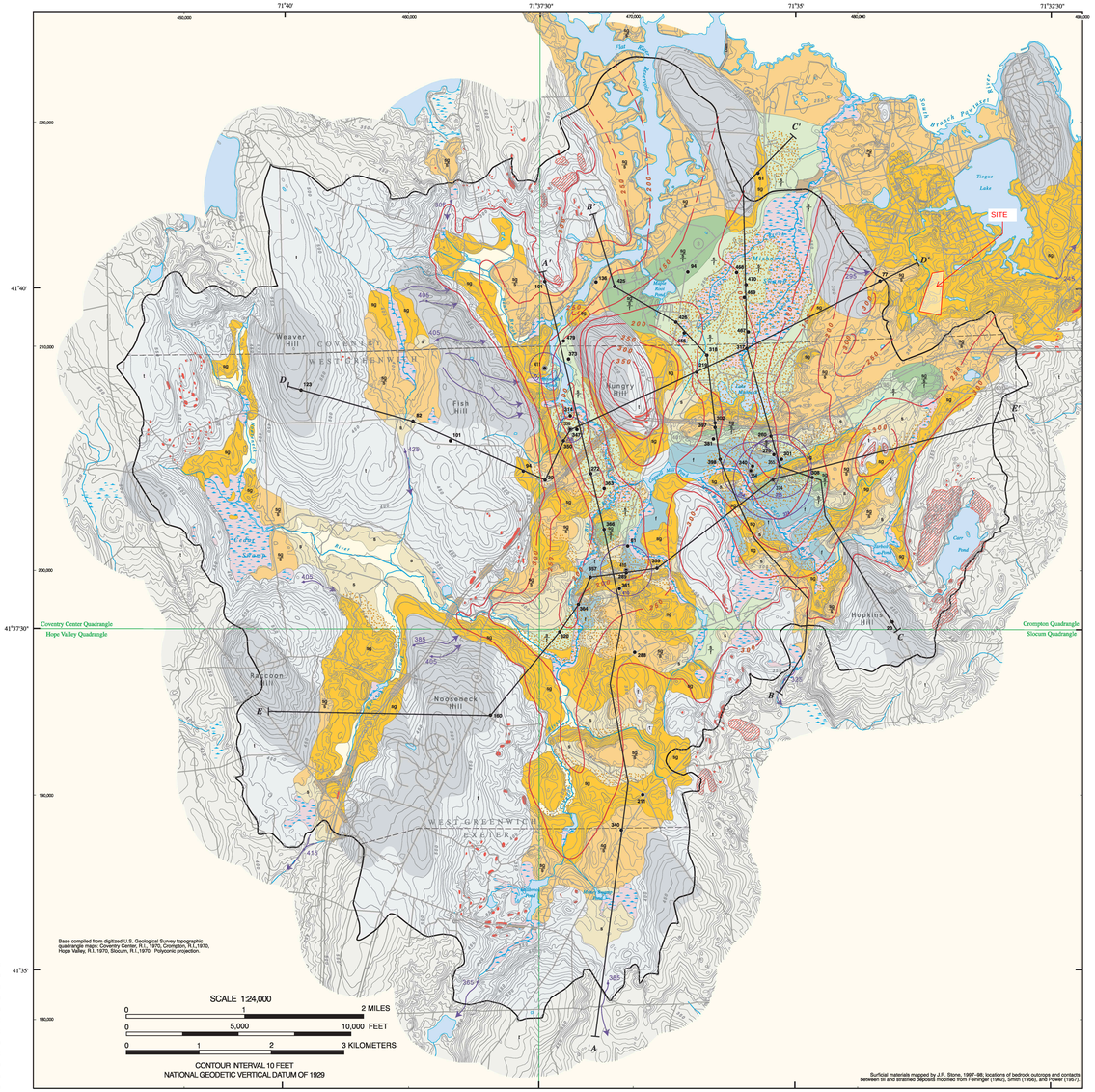
- ARTIFICIAL FILL
- ALLUVIUM
- SWAMP DEPOSITS
- SAND AND GRAVEL DEPOSITS
- SAND DEPOSITS
- FINE DEPOSITS

(Bedding shown schematically)

- TILL
- BEDROCK

CONW136-Projected — WELL OR TEST BORING AND IDENTIFIER—Length of line represents vertical extent of well or test boring; dashed line represents well projected onto line of section

VERTICAL EXAGGERATION X 10
0 2,000 4,000 FEET
0 500 1,000 METERS



DESCRIPTION OF MAP UNITS

POSTGLACIAL DEPOSITS—Alluvium is present beneath the floodplain surfaces of Big River, although many of these surfaces are also underlain by swamp deposits; swamp deposits also occur in positions isolated from the floodplain such as in kettle holes. Swamp deposits and alluvium are generally thin (less than 10 ft thick) and are underlain by thicker glacial deposits (see description below)

- Artificial fill—composed predominantly of earth materials emplaced along road embankments
- Alluvium—composed of sand and silt, locally gravel, with some organic material
- Swamp deposits—composed of peat and muck with minor amounts of sand, silt, and clay

GLACIAL MELTWATER DEPOSITS (STRATIFIED DEPOSITS)—Gravel, sand, silts, and clay particles (as described in particle size diagram), that occur in layers and are classified into three textural units based on grain-size distribution: Sand and gravel deposits, Sand deposits, and Fine deposits. The texture of glacial stratified deposits is described throughout their whole vertical extent either as a single textural unit or two or more units in various orders of superposition referred to as "stacked units." Areas where sand and gravel deposits underlie sand or fine deposits are shown by an orange dotted pattern. Contacts between subsurface textural units are not mapped with as great an accuracy or detail as those at the surface. All units of glacial stratified deposits overlie glacial till and (or) bedrock which is not included in the stacked unit

- sg — Sand and gravel deposits—composed of mixtures of sand and gravel particles within individual layers and as alternating layers; sand and gravel layers range from 25- to 50-percent gravel particles and from 50- to 75-percent sand particles. Layers are well- to poorly-sorted; bedding may be distorted by postdepositional collapse. Origin: Proximal deltaic and fluvial deposit and delta topset beds
- s — Sand deposits—composed mainly of very coarse to fine sand particles; coarser layers may contain up to 25-percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay. Layers are commonly well sorted. Origin: Deltaic foreset beds, distal lacustrine fan deposits and distal fluvial deposits
- f — Fine deposits—composed of very fine sand, silt, and clay particles, generally in well-sorted, thin layers of alternating silt and clay and (or) very fine sand; locally may contain lenses of coarser material. Origin: Lake-bottom deposits

STACKED MAP UNITS

- sg/s — Sand and gravel overlying sand—sand and gravel less than 20 ft thick, horizontally bedded and overlies thicker, inclined layers of sand. Origin: Deltaic deposits
- sg/f — Sand and gravel overlying sand overlying fines—sand and gravel is generally less than 20 ft in thickness, horizontally bedded and overlies thicker inclined beds of sand which in turn overlie thinly bedded fines of variable thickness. Origin: Deltaic deposits overlying lake-bottom sediment
- s/f — Sand overlying fines—sand is of variable thickness, commonly in inclined foreset beds and overlies thinly bedded fines of variable thickness. Origin: Distal deltaic deposits overlying lake-bottom sediment
- sg/t — Sand and gravel underlying sand or fines—buried sand and gravel is of variable thickness. Origin: Highly collapsed facies of ice-marginal deltaic or lacustrine deposits; deltas or fans are generally at land surface immediately south of the overlying finer deposits

GLACIAL ICE-LAID DEPOSITS

- t — TILL—cemented, unstratified, compact mixture of grain sizes ranging from clay to large boulders; matrix is largely sand particles containing up to 25-percent silt and clay. Till blankets the bedrock surface in most places and underlies glacial stratified deposits but is not included in the stacked units. Darker shaded pattern indicates areas where till is greater than 15 feet in thickness

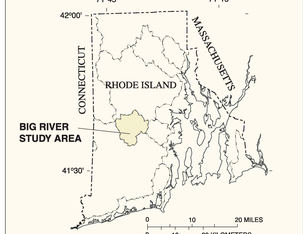
MAP SYMBOLS

- BEDROCK OUTCROPS—Pattern shows areas containing numerous closely spaced outcrops
- 250 — BEDROCK CONTOUR—Shows altitude in feet above sea level of the bedrock surface; Dashed where inferred. Shown only where bedrock surface is at or below 300 feet altitude (300 ft on Hungry Hill)
- CONTACT BETWEEN MAP UNITS
- STUDY-AREA BOUNDARY
- 325 — GLACIAL LAKE SPILLWAY—Number is approximate altitude in feet
- MELTWATER CHANNEL—Carved in till
- A A' — LINE OF GEOLOGIC SECTION
- 280 — WELL OR TEST HOLE AND IDENTIFIER—Used in construction of geologic sections
- 280 / 255 — PUMPING TEST WELL AND IDENTIFIER—Circle indicates approximate area of pumping influence based on the distance from the pumping well to the farthest observation well monitored during aquifer test

PARTICLE DIAMETER										
10	2.5	0.16	0.08	0.04	0.02	0.01	0.005	0.0025	0.00015	in.
256	64	4	2	1	0.5	0.25	0.125	0.068	0.004	mm
Boulders	Cobbles	Pebbles	Granules	Very coarse sand	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
GRAVEL PARTICLES				SAND PARTICLES					FINE PARTICLES	

Grain-size classification used in this report modified from Wentworth (1922)

RHODE ISLAND INDEX MAP



SURFICIAL MATERIALS MAP OF THE BIG RIVER AREA, CENTRAL RHODE ISLAND

By
Janet Radway Stone and David C. Dickerman

2002

USGS science for a changing world

Appendix D – Minimum Standard 4 – Conveyance and Natural Channel Protection Calculations

- Hydraulic Calculations
- Channel Protection – CPv

3 Davol Square, Suite C300
Providence, RI 02903
P 401.272.8100

Storm Drainage Compu

Design Parameters:

Design Storm: 100 Year

k_e = 0.5

Project 203208.00 CNE Lot 3 **Project #** 203208.00 CNE Lot 3

Calculated by AL **Date**

Checked by **Date**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						INLET CONTROL		OUTLET CONTROL			JUNCTION LOSS	
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q	V	n	PIPE	SLOPE	Q full	V full	LENGTH	FALL	RIM	INV	INV	W.S.E.	Freeboard	HW/D	HW	H	TW or h_o	HW	K_m	K_d
										cfs	fps		SIZE		ft^3/s	ft/s	ft	ft		UPPER	LOWER	ft	ft	ft	ft	ft	ft	junction	junction
	CB 1B	DMH 101B	0.41	0.62	0.26	0.26	0.43	5.0	11.0	2.8	4.6	0.012	12	0.0094	3.7	4.8	117	1.10	282.1	279.0	277.9	279.0	3.1	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 2B	CB 3B	1.16	0.51	0.59	0.59	0.05	5.0	11.0	6.5	6.1	0.012	15	0.0111	7.4	6.0	18	0.19	281.7	278.4	278.2	277.9	3.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 3B	DMH 101B	0.29	0.78	0.22	0.82	0.05	5.1	11.0	9.0	6.9	0.012	18	0.0134	13.2	7.5	22	0.30	281.7	278.1	277.8	277.5	4.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 101B	DMH 102B	0.00	0.00	0.00	1.07	0.29	5.5	10.7	11.5	7.0	0.012	18	0.0108	11.8	6.7	120	1.30	282.9	277.8	276.5	277.2	5.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 4B	DMH 102B	0.97	0.62	0.60	0.60	0.03	5.0	11.0	6.6	7.0	0.012	15	0.0166	9.0	7.3	12	0.20	279.8	276.8	276.6	276.8	3.0	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 5B	DMH 102B	1.16	0.60	0.70	0.70	0.06	5.0	11.0	7.7	6.0	0.012	18	0.0101	11.4	6.5	20	0.20	279.8	276.8	276.6	276.8	3.0	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 102B	DMH 104B	0.00	0.00	0.00	2.37	0.43	5.6	10.6	25.2	9.4	0.012	24	0.0145	29.5	9.4	241	3.49	279.8	276.5	273.0	275.4	4.4	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 6B	DMH 103B	0.67	0.72	0.48	0.48	0.24	5.0	11.0	5.3	6.4	0.012	15	0.0162	8.9	7.3	93	1.51	284.1	280.0	278.5	280.0	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 7B	DMH 103B	0.31	0.73	0.22	0.22	0.08	5.0	11.0	2.4	5.1	0.012	12	0.0155	4.8	6.1	26	0.40	283.3	278.9	278.5	278.9	4.4	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 103B	DMH 104B	0.00	0.00	0.00	0.71	0.08	5.2	10.9	7.7	7.9	0.012	15	0.0209	10.1	8.2	38	0.79	283.7	278.4	277.6	277.6	6.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 8B	CB 9B	0.21	0.65	0.14	0.14	0.08	5.0	11.0	1.5	3.9	0.012	12	0.0103	3.9	5.0	19	0.20	282.1	278.0	277.8	278.0	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 9B	DMH 104B	0.06	0.90	0.05	0.19	0.32	5.1	11.0	2.0	4.6	0.012	12	0.0133	4.5	5.7	90	1.20	282.1	277.7	276.5	277.7	4.5	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 104B	DMH 105B	0.00	0.00	0.00	3.26	0.47	5.9	10.4	34.0	8.5	0.012	36	0.0100	72.3	10.2	241	2.41	283.0	273.0	270.6	272.1	10.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 10B	CB 11B	0.05	0.90	0.05	0.05	0.12	5.0	11.0	0.5	2.9	0.012	12	0.0122	4.3	5.4	21	0.25	279.9	275.0	274.8	275.0	4.9	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 11B	DMH 105B	0.49	0.73	0.36	0.40	0.06	5.1	10.9	4.4	5.4	0.012	15	0.0118	7.6	6.2	21	0.25	280.0	274.7	274.5	274.7	5.3	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 105B	DMH 106B	0.00	0.00	0.00	3.66	0.05	6.0	10.4	37.9	8.9	0.012	36	0.0108	75.1	10.6	28	0.30	279.8	270.5	270.2	269.5	10.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 12B	DMH 106B	0.26	0.76	0.20	0.20	0.10	5.0	11.0	2.2	4.7	0.012	12	0.0128	4.4	5.6	27	0.35	279.8	275.1	274.8	275.1	4.7	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 106B	DMH 110B	0.00	0.00	0.00	3.86	0.14	6.1	10.3	39.7	8.6	0.012	36	0.0094	70.1	9.9	74	0.70	279.7	270.1	269.4	269.2	10.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 13B	CB 14B	0.22	0.75	0.17	0.17	0.06	5.0	11.0	1.8	4.4	0.012	12	0.0122	4.3	5.4	16	0.20	280.8	276.8	276.6	276.8	4.0	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 14B	DMH 107B	0.25	0.63	0.16	0.32	0.09	5.1	11.0	3.5	5.5	0.012	12	0.0129	4.4	5.6	31	0.40	280.8	276.5	276.1	276.5	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 107B	DMH 108B	0.00	0.00	0.00	0.32	0.31	5.2	10.9	3.5	5.3	0.012	12	0.0119	4.2	5.4	100	1.19	280.9	276.1	274.9	275.8	5.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 15B	DMH 108B	0.54	0.40	0.22	0.22	0.06	5.0	11.0	2.4	5.3	0.012	12	0.0168	5.0	6.4	18	0.30	279.8	276.0	275.7	276.0	3.8	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 108B	DMH 109B	0.00	0.00	0.00	0.54	0.08	5.3	10.9	5.9	5.8	0.012	15	0.0105	7.2	5.8	29	0.30	279.8	274.8	274.5	274.4	5.4	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 16B	DMH 109B	0.08	0.90	0.07	0.07	0.13	5.0	11.0	0.8	3.5	0.012	12	0.0144	4.6	5.9	28	0.40	279.4	275.5	275.1	275.5	3.9	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 109B	DMH 110B	0.00	0.00	0.00	0.61	0.08	5.4	10.8	6.6	6.4	0.012	15	0.0124	7.8	6.4	32	0.40	279.8	274.4	274.0	273.9	5.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 110B	DMH 111B	0.00	0.00	0.00	4.47	0.27	6.5	10.0	44.9	9.2	0.012	36	0.0100	72.3	10.2	151	1.51	278.5	269.1	267.6	268.0	10.5	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 17B	CB 18B	0.11	0.58	0.06	0.06	0.11	5.0	11.0	0.7	3.0	0.012	12	0.0100	3.9	4.9	20	0.20	278.7	274.0	273.8	274.0	4.7	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 18B	DMH 111B	0.49	0.74	0.36	0.42	0.24	5.1	10.9	4.6	7.3	0.012	12	0.0228	5.8	7.4	105	2.39	278.7	273.7	271.3	273.7	5.0	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 111B	WQU CS8	0.00	0.00	0.00	4.90	0.11	6.9	9.8	47.9	9.3	0.012	36	0.0101	72.6	10.3	60	0.60	276.0	267.5	266.9	266.4	9.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 19B	DMH 112B	1.49	0.27	0.40	0.40	0.10	5.0	11.0	4.4	5.1	0.012	15	0.0096	6.9	5.6	31	0.30	273.9	269.7	269.4	269.7	4.2	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	CB 20B	DMH 112B	0.77	0.46	0.35	0.35	0.07	5.0	11.0	3.9	5.6	0.012	15	0.0138	8.2	6.7	22	0.30	273.8	269.5	269.2	269.5	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.80
	DMH 112B	WQU CS8	0.00	0.00	0.00	0.76	0.12	5.1	10.9	8.3	6.1	0.012	18	0.0101	11.4	6.5	42	0.42	273.2	269.1	268.6	268.6	4.5	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU CS8	FES 282	0.00	0.00	0.00	5.65	0.29	7.1	9.6	54.6	9.8	0.012	36	0.0100	72.3	10.2	173	1.73	273.3	265.7	264.0	264.5	8.8	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1A	CB 2A	1.32	0.34	0.45	0.45	0.06	5.0	11.0	4.9	5.5	0.012	15	0.0106	7.2	5.9	19	0.20	268.0	264.9	264.6	264.5	3.5	0.00	0.00	0.0	0.0	0.00	0.20	0.00

Design Parameters:

Design Storm: 100 Year

k_e= 0.5

Project 203208.00 CNE Lot 3 **Project #** 203208.00 CNE Lot 3

Calculated by AL **Date**

Checked by **Date**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE							INLET CONTROL		OUTLET CONTROL			JUNCTION LOSS	
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q	V	n	PIPE	SLOPE	Q full	V full	LENGTH	FALL	RIM	INV	INV	W.S.E.	Freeboard	HW/D	HW	H	TW or h_o	HW	K_m	K_d
										cfs	fps		SIZE		ft^3/s	ft/s	ft	ft		UPPER	LOWER	ft	ft	ft	ft	ft	ft	junction	junction
	CB 2A	FES 281	0.25	0.69	0.17	0.62	0.09	5.1	11.0	6.8	5.4	0.012	18	0.0085	10.5	5.9	29	0.25	268.5	264.6	264.3	264.2	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1C	DMH 101C	1.06	0.47	0.50	0.50	0.04	5.0	11.0	5.5	7.5	0.012	12	0.0216	5.7	7.2	16	0.35	283.9	280.9	280.6	280.2	3.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2C	DMH 101C	0.10	0.90	0.09	0.09	0.05	5.0	11.0	1.0	4.4	0.012	12	0.0216	5.7	7.2	13	0.28	284.0	281.1	280.8	280.9	3.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 101C	DMH 102C	0.00	0.00	0.00	0.59	0.37	5.1	11.0	6.5	6.3	0.012	15	0.0124	7.8	6.4	141	1.75	283.9	280.6	278.8	280.1	3.8	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 3C	DMH 102C	0.51	0.60	0.31	0.31	0.06	5.0	11.0	3.4	5.7	0.012	12	0.0157	4.8	6.2	19	0.30	282.4	279.1	278.8	278.7	3.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 102C	WQU2 CS3	0.00	0.00	0.00	0.89	0.07	5.2	10.9	9.8	8.6	0.012	15	0.0212	10.2	8.3	38	0.81	281.9	278.8	278.0	277.9	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 4C	WQU2 CS3	0.14	0.78	0.11	0.11	0.11	5.0	11.0	1.2	3.9	0.012	12	0.0120	4.2	5.4	25	0.30	282.6	278.7	278.4	278.5	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU2 CS3	INF BASIN 1/3	0.00	0.00	0.00	1.00	0.05	5.3	10.9	10.9	7.3	0.012	18	0.0132	13.1	7.4	23	0.30	282.3	278.0	277.7	277.3	5.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1D	DMH 101D	1.28	0.51	0.65	0.65	0.05	5.0	11.0	7.2	6.3	0.012	15	0.0113	7.4	6.1	18	0.20	279.9	279.7	279.4	279.2	0.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2D	DMH 101D	0.18	0.90	0.16	0.16	0.07	5.0	11.0	1.8	4.2	0.012	12	0.0110	4.0	5.2	18	0.20	283.8	279.9	279.7	279.7	4.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2H	DMH 101H	0.50	0.54	0.27	0.27	0.05	5.0	11.0	3.0	4.7	0.012	12	0.0097	3.8	4.8	15	0.15	279.5	277.0	276.8	276.7	2.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 3D	DMH 102D	0.56	0.75	0.42	0.42	0.02	5.0	11.0	4.6	5.5	0.012	15	0.0113	7.4	6.1	8	0.09	283.5	279.5	279.4	279.1	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 102D	WQU5 CS5	0.00	0.00	0.00	0.69	0.32	5.2	10.9	7.5	5.7	0.012	24	0.0099	24.4	7.8	111	1.10	283.5	279.3	278.2	278.9	4.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 4D	CB 5D	0.72	0.65	0.47	0.47	0.05	5.0	11.0	5.1	5.6	0.012	15	0.0113	7.4	6.1	18	0.20	282.8	278.6	278.3	278.2	4.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 5D	WQU5 CS5	0.71	0.62	0.44	0.91	0.03	5.1	11.0	10.0	6.7	0.012	18	0.0110	11.9	6.8	14	0.15	282.8	278.4	278.1	277.8	5.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU5 CS5	UINF BASIN 1/3	0.00	0.00	0.00	1.60	0.02	5.6	10.7	17.1	7.8	0.012	24	0.0125	27.4	8.7	8	0.10	282.8	278.0	277.9	277.2	5.5	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1E	CB 2E	0.40	0.62	0.25	0.25	0.03	5.0	11.0	2.7	5.6	0.012	12	0.0182	5.2	6.6	11	0.20	284.8	281.0	280.8	280.6	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2E	WQU4 CS3	0.74	0.48	0.36	0.60	0.37	5.0	11.0	6.6	6.9	0.012	15	0.0157	8.8	7.1	153	2.40	284.8	280.6	278.2	280.0	4.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 3E	CB 4E	0.55	0.53	0.29	0.29	0.06	5.0	11.0	3.2	5.0	0.012	12	0.0111	4.1	5.2	18	0.20	284.4	280.5	280.3	280.2	4.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 4E	WQU4 CS3	0.48	0.53	0.25	0.55	0.22	5.0	11.0	6.0	7.2	0.012	15	0.0205	10.0	8.2	93	1.91	284.4	280.1	278.2	279.5	4.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU4 SC3	UINF BASIN	0.00	0.00	0.00	1.15	0.02	5.4	10.8	12.4	8.4	0.012	18	0.0172	14.9	8.4	12	0.21	284.9	278.2	278.0	277.3	7.5	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2F	CB 1F	0.37	0.66	0.24	0.24	0.06	5.0	11.0	2.7	4.8	0.012	12	0.0113	4.1	5.2	18	0.20	283.7	279.7	279.5	279.4	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1F	DMH 101F	1.20	0.58	0.70	0.94	0.05	5.1	11.0	10.3	6.6	0.012	18	0.0100	11.4	6.4	20	0.20	283.7	279.4	279.2	278.9	4.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 101F	HW 204	0.00	0.00	0.00	0.94	0.14	5.1	10.9	10.3	6.7	0.012	18	0.0107	11.8	6.7	56	0.60	283.8	279.2	278.6	278.6	5.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1G	WQU1 CS3	0.34	0.84	0.29	0.29	0.06	5.0	11.0	3.1	5.9	0.012	12	0.0183	5.2	6.6	22	0.40	284.0	279.5	279.1	279.1	4.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2G	WQU1 CS3	0.88	0.43	0.38	0.38	0.04	5.0	11.0	4.2	6.5	0.012	12	0.0187	5.3	6.7	16	0.30	284.0	279.4	279.1	278.9	5.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU1 CS3	DMH 101G	0.00	0.00	0.00	0.66	0.09	5.1	11.0	7.3	6.7	0.012	15	0.0132	8.0	6.6	38	0.50	284.3	279.1	278.5	278.5	5.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	HW 222	DMH 101G	0.00	0.00	0.00	0.94	0.24	5.0	11.0	10.3	9.5	0.012	15	0.0263	11.3	9.2	137	3.60	283.8	281.8	278.1	280.7	3.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 101G	UINF BASIN	0.00	0.00	0.00	1.60	0.36	5.3	10.8	17.3	7.4	0.012	24	0.0102	24.8	7.9	161	1.64	284.6	278.2	276.0	277.5	7.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1H	DMH 101H	0.31	0.44	0.14	0.14	0.08	5.0	11.0	1.5	4.0	0.012	12	0.0107	4.0	5.1	19	0.20	289.5	277.1	276.9	276.9	12.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2H	DMH 101H	0.50	0.54	0.27	0.27	0.05	5.0	11.0	3.0	4.7	0.012	12	0.0097	3.8	4.8	15	0.15	279.5	277.1	276.9	276.8	2.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00

Project 203208.00 CNE Lot 3 **Project #** 203208.00 CNE Lot 3

Calculated by AL **Date**

Checked by **Date**

Design Parameters:

Design Storm: 100 Year

k_e= 0.5

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						INLET CONTROL		OUTLET CONTROL			JUNCTION LOSS	
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q cfs	V fps	n	PIPE SIZE	SLOPE	Q full ft^3/s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER	W.S.E. ft	Freeboard ft	HW/D ft	HW ft	H ft	TW or h_o ft	HW ft	K_m junction	K_d junction
	DMH 101H	DMH 102H	0.00	0.00	0.00	0.41	0.26	5.1	11.0	4.5	5.2	0.012	15	0.0099	7.0	5.7	81	0.80	279.8	276.9	276.1	276.5	3.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 3H	CB 4H	0.69	0.69	0.47	0.47	0.05	5.0	11.0	5.2	5.6	0.012	15	0.0110	7.3	6.0	18	0.20	280.8	277.5	277.3	277.1	3.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 4H	DMH 102H	0.69	0.69	0.47	0.95	0.26	5.1	10.9	10.3	6.5	0.012	18	0.0097	11.2	6.3	103	1.00	280.8	277.2	276.2	276.7	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 5H	DMH 102H	0.31	0.66	0.20	0.20	0.03	5.0	11.0	2.2	5.8	0.012	12	0.0230	5.9	7.5	9	0.21	282.3	277.0	276.8	276.6	5.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMH 102H	WQU3 CS4	0.00	0.00	0.00	1.55	0.03	5.4	10.7	16.7	6.8	0.012	24	0.0085	22.6	7.2	13	0.11	282.2	276.1	276.0	275.6	6.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU3 CS4	UINF BASIN	0.00	0.00	0.00	1.55	0.28	5.4	10.7	16.7	6.0	0.012	24	0.0056	18.3	5.8	99	0.55	282.6	276.0	275.5	275.6	7.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1I	CB 2I	0.11	0.90	0.10	0.10	0.07	5.0	11.0	1.1	3.8	0.012	12	0.0124	4.3	5.5	16	0.20	280.7	276.6	276.4	276.4	4.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2I	WQU7 CS4	1.95	0.30	0.59	0.68	0.03	5.1	11.0	7.5	6.6	0.012	15	0.0124	7.8	6.4	12	0.15	280.8	276.3	276.1	275.8	5.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	WQU7 CS4	UINF BASIN	0.00	0.00	0.00	0.68	0.08	5.1	10.9	7.5	6.8	0.012	15	0.0136	8.2	6.7	32	0.44	280.8	276.1	275.6	275.5	5.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 1J	DMH 101J	0.18	0.60	0.11	0.11	0.07	5.0	11.0	1.2	3.9	0.012	12	0.0127	4.3	5.5	16	0.20	284.5	279.6	279.4	279.4	5.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	CB 2J	DMH 101J	0.04	0.82	0.03	0.03	0.10	5.0	11.0	0.4	2.6	0.012	12	0.0143	4.6	5.9	16	0.23	284.5	279.6	279.4	279.5	5.0	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	UINF BASIN 1/3	DMH 101J	0.00	0.00	0.00	2.60	0.16	5.0	11.0	2.0	5.0	0.012	10	0.0160	3.0	5.5	47	0.75	280.0	280.0	279.2	279.7	0.3	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMG 101J	DMH 102J						5.2	10.9	3.6	6.1	0.012	12	0.0177	5.1	6.5	79	1.40	284.7	279.2	277.8	278.7	5.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00
	DMG 102J	UINF BASIN	0.00	0.00	0.00	2.74	0.11	5.3	10.8	3.6	6.1	0.012	12	0.0174	5.1	6.5	40	0.70	285.2	277.8	277.1	277.3	7.9	0.00	0.00	0.0	0.0	0.00	0.20	0.00

Project:	EG Home	Project #	203208
Location:	Coventry, RI	Sheet:	1 of
Calculated By:	KC	Date:	9/24/2026
Checked By:		Date:	
Title:	Channel Protection Volume Calculation		

Computations

Runoff Vol. from 1-year storm

DP-1	0.0 CF
DP-2	0.0 CF
DP-3	0.0 CF
DP-4	0.0 CF

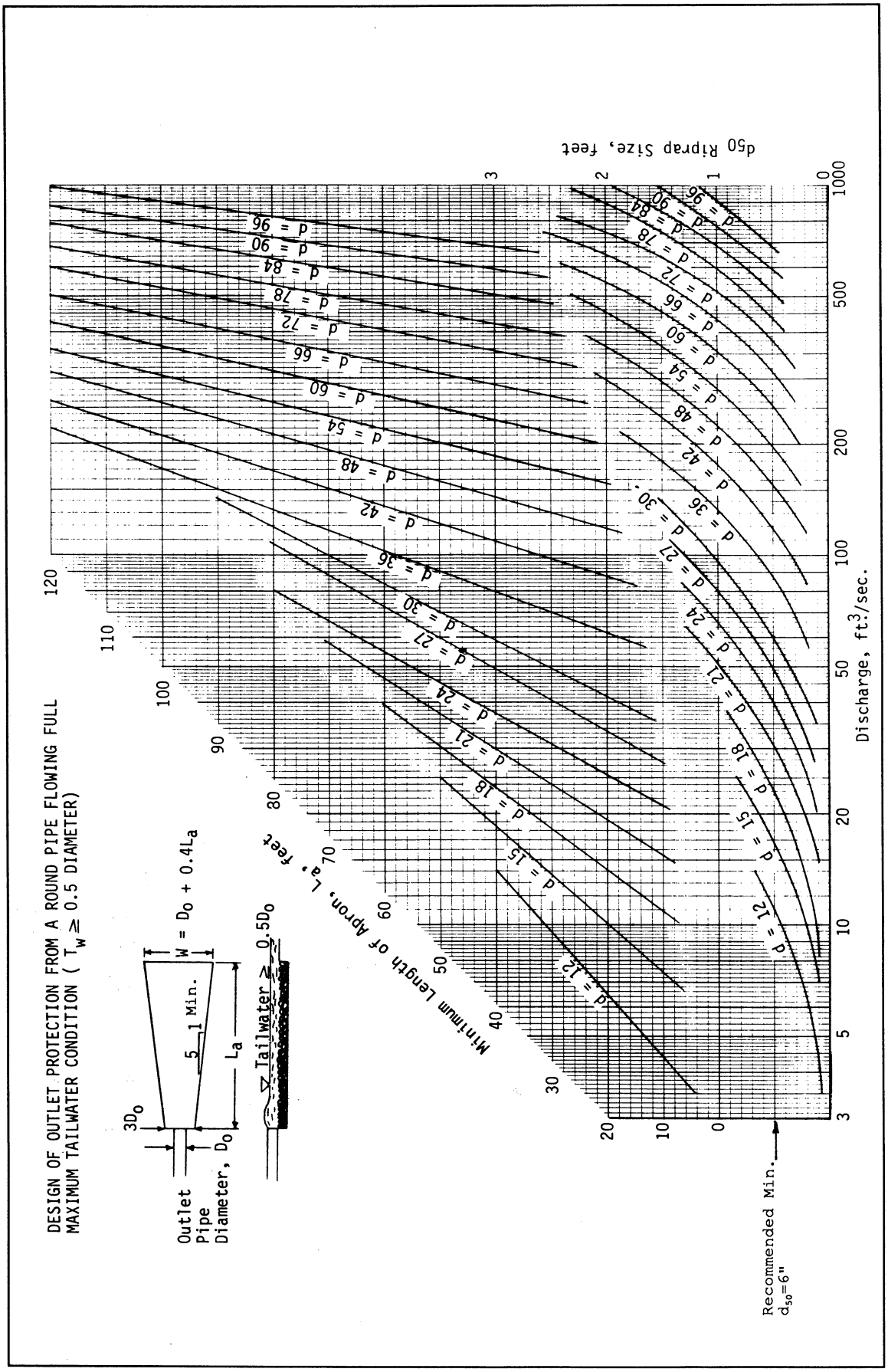
Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP1: DP1 off site north Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP2: DP-2 Depression NW Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP3: DP 3 Wetland A Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af



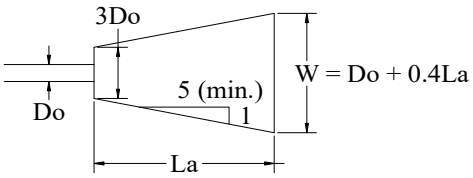
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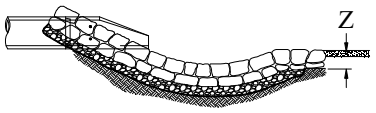
Plate 3.18-4

Outfall Riprap Sizing and Velocity Calculations

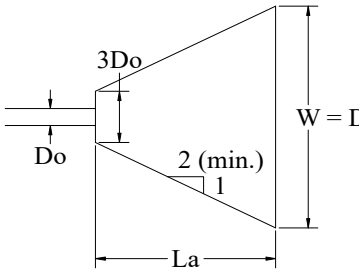
Project	EG Home Coventry, RI	**Project #**	203208.00
Calculated by	KC	**Date**	9/24/2026
Checked by		**Date**	

Tw ≥ 0.5Do





Tw < 0.5Do



OUTLET DESCRIPTION:		**1A&B**	**2**			
Design Storm	(yr)	100	100			
Flow / Discharge (Q)	(cfs)	27.0	49.0			
Defined Channel ?	-	NO	NO			
Defined Channel Width	(ft)	0	0			
Outlet Pipe Diameter (D_O)	(in)	72	36			
Tailwater Condition (T_W)	(ft)	TW ≥ 0.5D	TW ≥ 0.5D			
Apron Length (L_A)	(ft)	14	12			
Apron Width at Outlet ($3D_O$)	(ft)	14	9			
Apron Width at End (W)	(ft)	20	7.8			
Median Stone Diameter	(in)	6	6			
Largest Stone Diameter	(in)	9	9			
Apron Depth	(in)	13.5	13.5			

Apron Length (L_A): *Length = From Virginia DCR Handbook - Plate 3.18-3* *if T_W < 0.5D*

Length = From Virginia DCR Handbook - Plate 3.18-4 *if T_W ≥ 0.5D*

Apron Width at Outlet ($3D_O$): *Width = 3 x pipe dia. (or width of channel)*

Apron Width at End (W): *Width = dia. + apron length* *if T_W < 0.5D*

Width = dia. + 0.4 x apron length *if T_W ≥ 0.5D*

or apron width = channel width if a well defined channel exists

Rock Riprap: *Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4*

Largest stone dia = 1.5 x d_{50}

Apron Depth: *6" or 1.5 x largest stone dia*

Appendix E – Minimum Standard 5 – Overbank Flood Protection – HydroCAD Calculations

- Existing Conditions - HydroCAD Model
  - 1-Year Storm Event
  - 10-Year Storm Event
  - 100-Year Storm Event
- Proposed Conditions – HydroCAD Model
  - 1-Year Storm Event
  - 10-Year Storm Event
  - 100-Year Storm Event

Existing Conditions – HydroCAD Model

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Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- 200' JURISDICTIONAL AREA
- 75' / 100' BUFFER ZONE
- WETLAND BOUNDARY

SCS SOIL CLASSIFICATIONS

- HkC — HINCKLEY LOAMY SAND, 8 TO 15 PERCENT SLOPES, HSG A
- MmB — MERRIMAC FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG A
- MU — MERRIMAC URBAN SANDY LOAM, 0 TO 8 PERCENT SLOPES, HSG A
- Pg — PITS, GRAVEL, HSG UNRANKED
- Sb — SCARBORO MUCKY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES, HSG A/D
- Wa — WALPOLE SANDY LOAM, 0 TO 3 PERCENT SLOPES, HSG B/D

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EG Homes

AP 14, Lot 65, Parcel 3
Coventry, Rhode Island

No.	Revision	Date	Approved

Designed by	Checked by
KC	JR

Issued for

Permits

Date

October 2, 2026

Not Approved for Construction

Drawing Title

Existing Drainage Map

Drawing Number

FIG.2

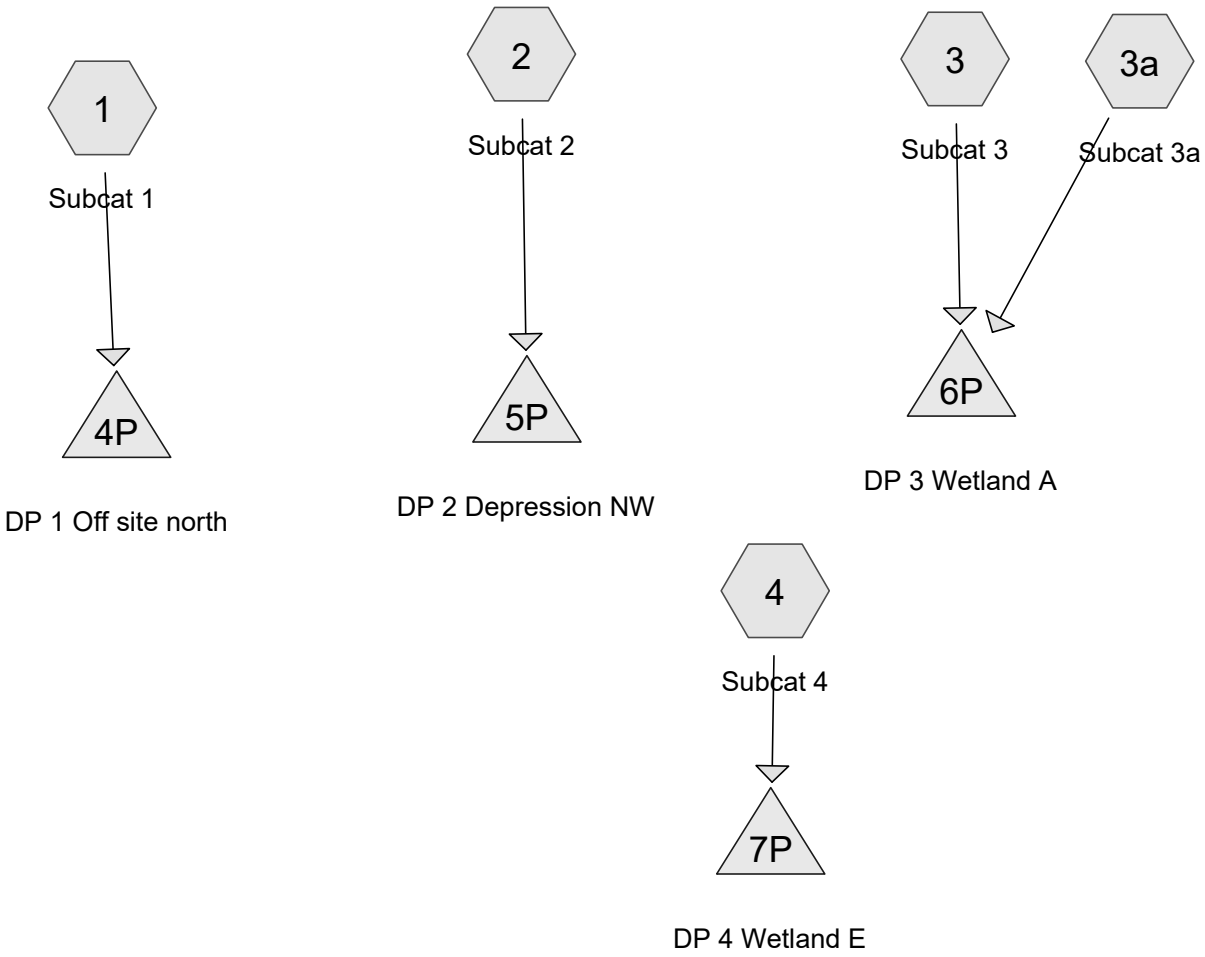
Sheet

1 of 2

Project Number

203208.00

Saved Tuesday, September 29, 2026 11:09:05 AM SPEREIRA Plotted Wednesday, September 30, 2026 12:35:55 PM Stephen Pereira



Subcat Reach Pond Link

Routing Diagram for 203208.00 EX Drainage
Prepared by VHB, Inc, Printed 9/24/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=29.946 ac 0.00% Impervious Runoff Depth=0.01"
Tc=0.0 min CN=46 Runoff=0.04 cfs 0.026 af

Subcatchment2: Subcat 2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=164' Slope=0.0060 '/' Tc=6.0 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment3: Subcat 3 Runoff Area=0.719 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=193' Slope=0.1100 '/' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment3a: Subcat 3a Runoff Area=0.180 ac 0.00% Impervious Runoff Depth=0.59"
Flow Length=66' Tc=6.0 min CN=71 Runoff=0.10 cfs 0.009 af

Subcatchment4: Subcat 4 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth=0.59"
Tc=0.0 min CN=71 Runoff=0.07 cfs 0.005 af

Pond 4P: DP 1 Off site north Inflow=0.04 cfs 0.026 af
Primary=0.04 cfs 0.026 af

Pond 5P: DP 2 Depression NW Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond 6P: DP 3 Wetland A Inflow=0.10 cfs 0.009 af
Primary=0.10 cfs 0.009 af

Pond 7P: DP 4 Wetland E Inflow=0.07 cfs 0.005 af
Primary=0.07 cfs 0.005 af

Total Runoff Area = 32.605 ac Runoff Volume = 0.040 af Average Runoff Depth = 0.01"
100.00% Pervious = 32.605 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

Runoff = 0.04 cfs @ 21.62 hrs, Volume= 0.026 af, Depth= 0.01"
Routed to Pond 4P : DP 1 Off site north

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
6.763	76	Gravel roads, HSG A
11.830	30	Woods, Good, HSG A
8.481	32	Woods/grass comb., Good, HSG A
0.736	39	>75% Grass cover, Good, HSG A
2.137	96	Gravel surface, HSG A
29.946	46	Weighted Average
29.946		100.00% Pervious Area

Summary for Subcatchment 2: Subcat 2

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond 5P : DP 2 Depression NW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.298	30	Woods, Good, HSG A
1.349	32	Woods/grass comb., Good, HSG A
0.003	76	Gravel roads, HSG A
1.650	32	Weighted Average
1.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0060	1.25		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
3.8					**Direct Entry, Minimum Tc**
6.0	164	Total			

Summary for Subcatchment 3: Subcat 3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond 6P : DP 3 Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.719	30	Woods, Good, HSG A
0.719		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	193	0.1100	5.34		**Shallow Concentrated Flow, Overland** Unpaved Kv= 16.1 fps
5.4					**Direct Entry, Minimum Tc**
6.0	193	Total			

Summary for Subcatchment 3a: Subcat 3a

Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af, Depth= 0.59"
Routed to Pond 6P : DP 3 Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.020	30	Woods, Good, HSG A
0.160	76	Gravel roads, HSG A
0.180	71	Weighted Average
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0380	1.16		**Sheet Flow, gravel drive** Smooth surfaces n= 0.011 P2= 3.30"
0.3	55	0.0450	3.42		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
5.5					**Direct Entry, Minimum Tc**
6.0	66	Total			

Summary for Subcatchment 4: Subcat 4

Runoff = 0.07 cfs @ 12.02 hrs, Volume= 0.005 af, Depth= 0.59"
Routed to Pond 7P : DP 4 Wetland E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.013	30	Woods, Good, HSG A
0.097	76	Gravel roads, HSG A
0.110	71	Weighted Average
0.110		100.00% Pervious Area

Summary for Pond 4P: DP 1 Off site north

Inflow Area = 29.946 ac, 0.00% Impervious, Inflow Depth = 0.01" for 1- Year event
Inflow = 0.04 cfs @ 21.62 hrs, Volume= 0.026 af
Primary = 0.04 cfs @ 21.62 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P: DP 2 Depression NW

Inflow Area = 1.650 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P: DP 3 Wetland A

Inflow Area = 0.899 ac, 0.00% Impervious, Inflow Depth = 0.12" for 1- Year event
Inflow = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af
Primary = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P: DP 4 Wetland E

Inflow Area = 0.110 ac, 0.00% Impervious, Inflow Depth = 0.59" for 1- Year event
Inflow = 0.07 cfs @ 12.02 hrs, Volume= 0.005 af
Primary = 0.07 cfs @ 12.02 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=29.946 ac 0.00% Impervious Runoff Depth=0.07"
Tc=0.0 min CN=46 Runoff=0.28 cfs 0.178 af

Subcatchment2: Subcat 2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=164' Slope=0.0060 '/' Tc=6.0 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment3: Subcat 3 Runoff Area=0.719 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=193' Slope=0.1100 '/' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment3a: Subcat 3a Runoff Area=0.180 ac 0.00% Impervious Runoff Depth=0.94"
Flow Length=66' Tc=6.0 min CN=71 Runoff=0.18 cfs 0.014 af

Subcatchment4: Subcat 4 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth=0.94"
Tc=0.0 min CN=71 Runoff=0.13 cfs 0.009 af

Pond 4P: DP 1 Off site north Inflow=0.28 cfs 0.178 af
Primary=0.28 cfs 0.178 af

Pond 5P: DP 2 Depression NW Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond 6P: DP 3 Wetland A Inflow=0.18 cfs 0.014 af
Primary=0.18 cfs 0.014 af

Pond 7P: DP 4 Wetland E Inflow=0.13 cfs 0.009 af
Primary=0.13 cfs 0.009 af

Total Runoff Area = 32.605 ac Runoff Volume = 0.201 af Average Runoff Depth = 0.07"
100.00% Pervious = 32.605 ac 0.00% Impervious = 0.000 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=29.946 ac 0.00% Impervious Runoff Depth=0.42"
Tc=0.0 min CN=46 Runoff=5.76 cfs 1.057 af

Subcatchment2: Subcat 2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=0.01"
Flow Length=164' Slope=0.0060 '/' Tc=6.0 min CN=32 Runoff=0.00 cfs 0.002 af

Subcatchment3: Subcat 3 Runoff Area=0.719 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=193' Slope=0.1100 '/' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment3a: Subcat 3a Runoff Area=0.180 ac 0.00% Impervious Runoff Depth=1.97"
Flow Length=66' Tc=6.0 min CN=71 Runoff=0.40 cfs 0.030 af

Subcatchment4: Subcat 4 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth=1.97"
Tc=0.0 min CN=71 Runoff=0.29 cfs 0.018 af

Pond 4P: DP 1 Off site north Inflow=5.76 cfs 1.057 af
Primary=5.76 cfs 1.057 af

Pond 5P: DP 2 Depression NW Inflow=0.00 cfs 0.002 af
Primary=0.00 cfs 0.002 af

Pond 6P: DP 3 Wetland A Inflow=0.40 cfs 0.030 af
Primary=0.40 cfs 0.030 af

Pond 7P: DP 4 Wetland E Inflow=0.29 cfs 0.018 af
Primary=0.29 cfs 0.018 af

Total Runoff Area = 32.605 ac Runoff Volume = 1.107 af Average Runoff Depth = 0.41"
100.00% Pervious = 32.605 ac 0.00% Impervious = 0.000 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=29.946 ac 0.00% Impervious Runoff Depth=0.95"
Tc=0.0 min CN=46 Runoff=25.59 cfs 2.375 af

Subcatchment2: Subcat 2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=164' Slope=0.0060 '/' Tc=6.0 min CN=32 Runoff=0.04 cfs 0.023 af

Subcatchment3: Subcat 3 Runoff Area=0.719 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=193' Slope=0.1100 '/' Tc=6.0 min CN=30 Runoff=0.01 cfs 0.006 af

Subcatchment3a: Subcat 3a Runoff Area=0.180 ac 0.00% Impervious Runoff Depth=3.06"
Flow Length=66' Tc=6.0 min CN=71 Runoff=0.63 cfs 0.046 af

Subcatchment4: Subcat 4 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth=3.06"
Tc=0.0 min CN=71 Runoff=0.45 cfs 0.028 af

Pond 4P: DP 1 Off site north Inflow=25.59 cfs 2.375 af
Primary=25.59 cfs 2.375 af

Pond 5P: DP 2 Depression NW Inflow=0.04 cfs 0.023 af
Primary=0.04 cfs 0.023 af

Pond 6P: DP 3 Wetland A Inflow=0.63 cfs 0.052 af
Primary=0.63 cfs 0.052 af

Pond 7P: DP 4 Wetland E Inflow=0.45 cfs 0.028 af
Primary=0.45 cfs 0.028 af

Total Runoff Area = 32.605 ac Runoff Volume = 2.477 af Average Runoff Depth = 0.91"
100.00% Pervious = 32.605 ac 0.00% Impervious = 0.000 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=29.946 ac 0.00% Impervious Runoff Depth=2.23"
Tc=0.0 min CN=46 Runoff=80.44 cfs 5.566 af

Subcatchment2: Subcat 2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=0.77"
Flow Length=164' Slope=0.0060 '/' Tc=6.0 min CN=32 Runoff=0.57 cfs 0.106 af

Subcatchment3: Subcat 3 Runoff Area=0.719 ac 0.00% Impervious Runoff Depth=0.59"
Flow Length=193' Slope=0.1100 '/' Tc=6.0 min CN=30 Runoff=0.16 cfs 0.036 af

Subcatchment3a: Subcat 3a Runoff Area=0.180 ac 0.00% Impervious Runoff Depth=5.19"
Flow Length=66' Tc=6.0 min CN=71 Runoff=1.07 cfs 0.078 af

Subcatchment4: Subcat 4 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth=5.19"
Tc=0.0 min CN=71 Runoff=0.77 cfs 0.048 af

Pond 4P: DP 1 Off site north Inflow=80.44 cfs 5.566 af
Primary=80.44 cfs 5.566 af

Pond 5P: DP 2 Depression NW Inflow=0.57 cfs 0.106 af
Primary=0.57 cfs 0.106 af

Pond 6P: DP 3 Wetland A Inflow=1.09 cfs 0.114 af
Primary=1.09 cfs 0.114 af

Pond 7P: DP 4 Wetland E Inflow=0.77 cfs 0.048 af
Primary=0.77 cfs 0.048 af

Total Runoff Area = 32.605 ac Runoff Volume = 5.833 af Average Runoff Depth = 2.15"
100.00% Pervious = 32.605 ac 0.00% Impervious = 0.000 ac

Proposed Conditions – HydroCAD Model



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Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
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- MU — MERRIMAC URBAN SANDY LOAM, 0 TO 8 PERCENT SLOPES, HSG A
- Pg — PITS, GRAVEL, HSG UNRANKED
- Sb — SCARBORO MUCKY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES, HSG A/D
- Wa — WALPOLE SANDY LOAM, 0 TO 3 PERCENT SLOPES, HSG B/D

EG Homes

AP 14, Lot 65, Parcel 3
Coventry, Rhode Island

No.	Revision	Date	Approved

Designed by: KC
Checked by: JR

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Permits

Date
October 2, 2026

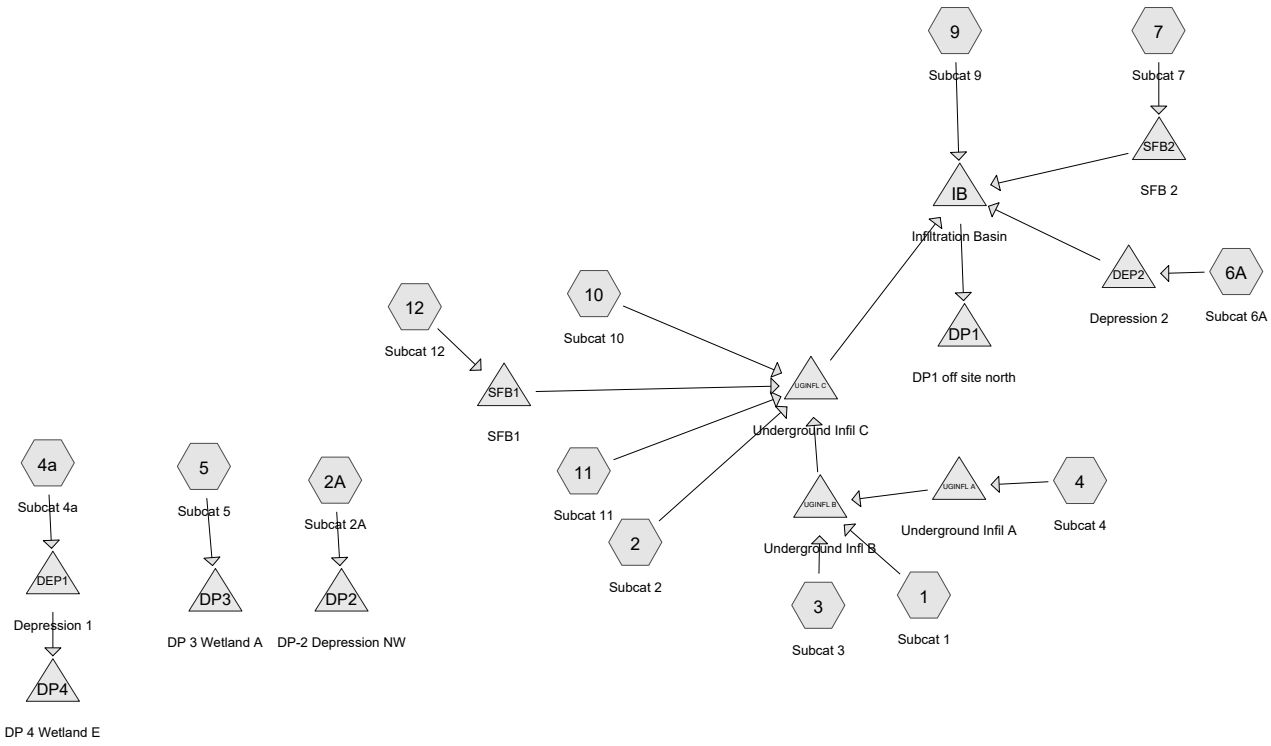
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Drawing Title
Proposed Drainage Map

Drawing Number
FIG.3

Sheet
2 of 2

Project Number
203208.00



Subcat Reach Pond Link

Routing Diagram for 203208.00 PR Drainage
Prepared by VHB, Inc, Printed 9/29/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.816 ac 59.69% Impervious Runoff Depth=0.72"
Flow Length=464' Tc=16.4 min CN=74 Runoff=2.12 cfs 0.230 af

Subcatchment2: Subcat 2 Runoff Area=2.518 ac 56.75% Impervious Runoff Depth=0.64"
Flow Length=488' Tc=13.5 min CN=72 Runoff=1.26 cfs 0.133 af

Subcatchment2A: Subcat 2A Runoff Area=1.679 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=106' Tc=6.0 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment3: Subcat 3 Runoff Area=2.264 ac 49.89% Impervious Runoff Depth=0.44"
Flow Length=482' Tc=13.7 min CN=67 Runoff=0.65 cfs 0.084 af

Subcatchment4: Subcat 4 Runoff Area=1.802 ac 48.39% Impervious Runoff Depth=0.41"
Flow Length=466' Tc=16.2 min CN=66 Runoff=0.43 cfs 0.061 af

Subcatchment4a: Subcat 4a Runoff Area=1.083 ac 3.14% Impervious Runoff Depth=0.00"
Flow Length=125' Tc=8.3 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment5: Subcat 5 Runoff Area=0.070 ac 0.28% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment6A: Subcat 6A Runoff Area=1.200 ac 23.56% Impervious Runoff Depth=0.06"
Flow Length=372' Tc=8.9 min CN=51 Runoff=0.01 cfs 0.006 af

Subcatchment7: Subcat 7 Runoff Area=1.663 ac 24.34% Impervious Runoff Depth=0.09"
Flow Length=418' Tc=6.0 min CN=53 Runoff=0.02 cfs 0.012 af

Subcatchment9: Subcat 9 Runoff Area=10.952 ac 44.44% Impervious Runoff Depth=0.38"
Flow Length=1,128' Tc=11.0 min CN=65 Runoff=2.53 cfs 0.343 af

Subcatchment10: Subcat 10 Runoff Area=0.977 ac 54.10% Impervious Runoff Depth=0.59"
Tc=6.0 min CN=71 Runoff=0.57 cfs 0.048 af

Subcatchment11: Subcat 11 Runoff Area=3.097 ac 35.18% Impervious Runoff Depth=0.23"
Flow Length=598' Tc=11.1 min CN=60 Runoff=0.30 cfs 0.060 af

Subcatchment12: Subcat 12 Runoff Area=1.578 ac 47.53% Impervious Runoff Depth=0.44"
Flow Length=295' Tc=6.0 min CN=67 Runoff=0.59 cfs 0.058 af

Pond DEP1: Depression 1 Peak Elev=284.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond DEP2: Depression 2 Peak Elev=280.00' Storage=0 cf Inflow=0.01 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond DP1: DP1 off site north Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP2: DP-2 Depression NW Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP3: DP 3 Wetland A Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond IB: Infiltration Basin Peak Elev=263.66' Storage=2,535 cf Inflow=2.53 cfs 0.345 af
Discarded=0.88 cfs 0.345 af Primary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.345 af

Pond SFB1: SFB1 Peak Elev=281.02' Storage=2,537 cf Inflow=0.59 cfs 0.058 af
15.0" Round Culvert n=0.012 L=137.0' S=0.0263 '/' Outflow=0.00 cfs 0.000 af

Pond SFB2: SFB 2 Peak Elev=264.00' Storage=425 cf Inflow=0.02 cfs 0.012 af
Outflow=0.01 cfs 0.002 af

Pond UGINFL A: Underground Infil A Peak Elev=276.93' Storage=0.002 af Inflow=0.43 cfs 0.061 af
Discarded=0.41 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.061 af

Pond UGINFL B: Underground Infl B Peak Elev=277.30' Storage=0.067 af Inflow=2.77 cfs 0.314 af
Discarded=0.92 cfs 0.314 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 0.314 af

Pond UGINFL C: Underground Infil C Peak Elev=275.05' Storage=0.022 af Inflow=1.87 cfs 0.242 af
Discarded=1.48 cfs 0.242 af Primary=0.00 cfs 0.000 af Outflow=1.48 cfs 0.242 af

Total Runoff Area = 32.698 ac Runoff Volume = 1.036 af Average Runoff Depth = 0.38"
58.21% Pervious = 19.034 ac 41.79% Impervious = 13.664 ac

Summary for Subcatchment 1: Subcat 1

Runoff = 2.12 cfs @ 12.25 hrs, Volume= 0.230 af, Depth= 0.72"
Routed to Pond UGINFL B : Underground Infl B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
2.277	98	Paved parking, HSG A
0.170	30	Woods, Good, HSG A
1.369	39	>75% Grass cover, Good, HSG A
3.816	74	Weighted Average
1.538	38	40.31% Pervious Area
2.277	98	59.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0100	0.08		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
4.3	131	0.0010	0.51		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
1.0	117	0.0090	1.93		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
0.5	166	0.0120	5.38	4.23	**Pipe Channel, Drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
16.4	464	Total			

Summary for Subcatchment 2: Subcat 2

Runoff = 1.26 cfs @ 12.21 hrs, Volume= 0.133 af, Depth= 0.64"
Routed to Pond UGINFL C : Underground Infil C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
1.429	98	Paved parking, HSG A
0.000	30	Woods, Good, HSG A
1.089	39	>75% Grass cover, Good, HSG A
2.518	72	Weighted Average
1.089	39	43.25% Pervious Area
1.429	98	56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0100	0.08		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
1.5	146	0.0100	1.61		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
1.1	196	0.0210	2.94		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
0.3	96	0.0110	5.15	4.05	**Pipe Channel, Drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
13.5	488	Total			

Summary for Subcatchment 2A: Subcat 2A

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond DP2 : DP-2 Depression NW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.497	30	Woods, Good, HSG A
0.611	32	Woods/grass comb., Good, HSG A
0.571	39	>75% Grass cover, Good, HSG A
1.679	34	Weighted Average
1.679	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	17	0.3000	0.25		**Sheet Flow, grass slope** Grass: Dense n= 0.240 P2= 3.30"
0.9	89	0.0110	1.69		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
3.9					**Direct Entry, minimum Tc**
6.0	106	Total			

Summary for Subcatchment 3: Subcat 3

Runoff = 0.65 cfs @ 12.24 hrs, Volume= 0.084 af, Depth= 0.44"
Routed to Pond UGINFL B : Underground Infl B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
1.130	98	Paved parking, HSG A
0.302	30	Woods, Good, HSG A
0.833	39	>75% Grass cover, Good, HSG A
2.264	67	Weighted Average
1.134	37	50.11% Pervious Area
1.130	98	49.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0100	0.08		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
1.3	116	0.0090	1.53		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
1.1	135	0.0110	2.13		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
0.7	181	0.0082	4.45	3.50	**Pipe Channel, Drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
13.7	482	Total			

Summary for Subcatchment 4: Subcat 4

Runoff = 0.43 cfs @ 12.30 hrs, Volume= 0.061 af, Depth= 0.41"
Routed to Pond UGINFL A : Underground Infil A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.872	98	Paved parking, HSG A
0.250	30	Woods, Good, HSG A
0.680	39	>75% Grass cover, Good, HSG A
1.802	66	Weighted Average
0.930	37	51.61% Pervious Area
0.872	98	48.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0100	0.08		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
3.8	14	0.0100	0.06		**Sheet Flow, overland** Grass: Dense n= 0.240 P2= 3.30"
0.4	46	0.0110	2.13		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
1.4	356	0.0070	4.11	3.23	**Pipe Channel, Drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
16.2	466	Total			

Summary for Subcatchment 4a: Subcat 4a

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond DEP1 : Depression 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

	Area (ac)	CN	Description
*	0.034	98	Roof, HSG A
	0.461	30	Woods, Good, HSG A
	0.588	39	>75% Grass cover, Good, HSG A
	1.083	37	Weighted Average
	1.049	35	96.86% Pervious Area
	0.034	98	3.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0600	0.11		**Sheet Flow, overland** Woods: Light underbrush n= 0.400 P2= 3.30"
0.5	75	0.0260	2.60		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
8.3	125	Total			

Summary for Subcatchment 5: Subcat 5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond DP3 : DP 3 Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.070	30	Woods, Good, HSG A
0.000	39	>75% Grass cover, Good, HSG A
0.000	98	Paved parking, HSG A
0.070	30	Weighted Average
0.070	30	99.72% Pervious Area
0.000	98	0.28% Impervious Area

Summary for Subcatchment 6A: Subcat 6A

Runoff = 0.01 cfs @ 14.90 hrs, Volume= 0.006 af, Depth= 0.06"
Routed to Pond DEP2 : Depression 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.283	98	Paved parking, HSG A
0.686	39	>75% Grass cover, Good, HSG A
0.231	30	Woods, Good, HSG A
1.200	51	Weighted Average
0.917	37	76.44% Pervious Area
0.283	98	23.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0240	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.30"
3.7	322	0.0080	1.44		**Shallow Concentrated Flow, OVERLAND** Unpaved Kv= 16.1 fps
8.9	372	Total			

Summary for Subcatchment 7: Subcat 7

Runoff = 0.02 cfs @ 13.70 hrs, Volume= 0.012 af, Depth= 0.09"
Routed to Pond SFB2 : SFB 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.405	98	Paved parking, HSG A
0.149	30	Woods, Good, HSG A
1.109	39	>75% Grass cover, Good, HSG A
1.663	53	Weighted Average
1.258	38	75.66% Pervious Area
0.405	98	24.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	60	0.2500	0.29		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
1.8	286	0.0180	2.72		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
0.2	72	0.0250	7.77	6.10	**Pipe Channel, Drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
0.6					**Direct Entry, Minimum**
6.0	418	Total			

Summary for Subcatchment 9: Subcat 9

Runoff = 2.53 cfs @ 12.21 hrs, Volume= 0.343 af, Depth= 0.38"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
4.866	98	Paved parking, HSG A
0.675	30	Woods, Good, HSG A
5.410	39	>75% Grass cover, Good, HSG A
10.952	65	Weighted Average
6.085	38	55.56% Pervious Area
4.866	98	44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, overland** Grass: Dense n= 0.240 P2= 3.30"
0.5	68	0.0190	2.22		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
0.6	156	0.0090	4.66	3.66	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
1.0	484	0.0160	8.15	14.39	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Corrugated PP, smooth interior
0.8	370	0.0105	7.99	25.11	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
11.0	1,128	Total			

Summary for Subcatchment 10: Subcat 10

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.048 af, Depth= 0.59"
Routed to Pond UGINFL C : Underground Infil C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.449	39	>75% Grass cover, Good, HSG A
0.529	98	Paved parking, HSG A
0.977	71	Weighted Average
0.449	39	45.90% Pervious Area
0.529	98	54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 11: Subcat 11

Runoff = 0.30 cfs @ 12.39 hrs, Volume= 0.060 af, Depth= 0.23"
Routed to Pond UGINFL C : Underground Infil C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
1.090	98	Paved parking, HSG A
2.007	39	>75% Grass cover, Good, HSG A
3.097	60	Weighted Average
2.007	39	64.82% Pervious Area
1.090	98	35.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
1.3	156	0.0160	2.04		**Shallow Concentrated Flow, overland** Unpaved Kv= 16.1 fps
0.8	95	0.0150	1.97		**Shallow Concentrated Flow, grass** Unpaved Kv= 16.1 fps
0.9	297	0.0080	5.76	10.18	**Pipe Channel, Drain pipe** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Corrugated PP, smooth interior
11.1	598	Total			

Summary for Subcatchment 12: Subcat 12

Runoff = 0.59 cfs @ 12.11 hrs, Volume= 0.058 af, Depth= 0.44"
Routed to Pond SFB1 : SFB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1- Year Rainfall=2.70"

Area (ac)	CN	Description
0.750	98	Paved parking, HSG A
0.828	39	>75% Grass cover, Good, HSG A
0.000	30	Woods, Good, HSG A
1.578	67	Weighted Average
0.828	39	52.47% Pervious Area
0.750	98	47.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.30"
1.0	104	0.0125	1.80		**Shallow Concentrated Flow, grass** Unpaved Kv= 16.1 fps
0.6	73	0.0089	1.92		**Shallow Concentrated Flow, gutter** Paved Kv= 20.3 fps
0.2	68	0.0170	6.41	5.03	**Pipe Channel, drain pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
6.0	295	Total			

Summary for Pond DEP1: Depression 1

Inflow Area = 1.083 ac, 3.14% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond DP4 : DP 4 Wetland E

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 284.00' @ 0.00 hrs Surf.Area= 2,003 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	284.00'	9,834 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
284.00	2,003	261.0	0	0	2,003
285.00	21,012	628.0	9,834	9,834	27,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	284.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	284.99'	**628.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=284.00' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.11 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=284.00' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DEP2: Depression 2

Inflow Area = 1.200 ac, 23.56% Impervious, Inflow Depth = 0.06" for 1- Year event
Inflow = 0.01 cfs @ 14.90 hrs, Volume= 0.006 af
Outflow = 0.01 cfs @ 14.92 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.9 min
Discarded = 0.01 cfs @ 14.92 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 280.00' @ 14.92 hrs Surf.Area= 6,634 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.006 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (1,069.1 - 1,068.3)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	8,616 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.00	6,634	461.0	0	0	6,634
281.00	10,763	577.0	8,616	8,616	16,230

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	280.99'	**40.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=1.27 cfs @ 14.92 hrs HW=280.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DP1: DP1 off site north

Inflow Area = 29.866 ac, 45.64% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: DP-2 Depression NW

Inflow Area = 1.679 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 23P

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond DP3: DP 3 Wetland A

Inflow Area = 0.070 ac, 0.28% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond DP4: DP 4 Wetland E

Inflow Area = 1.083 ac, 3.14% Impervious, Inflow Depth = 0.00" for 1- Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond IB: Infiltration Basin

Inflow Area = 29.866 ac, 45.64% Impervious, Inflow Depth = 0.14" for 1- Year event
Inflow = 2.53 cfs @ 12.21 hrs, Volume= 0.345 af
Outflow = 0.88 cfs @ 12.76 hrs, Volume= 0.345 af, Atten= 65%, Lag= 33.3 min
Discarded = 0.88 cfs @ 12.76 hrs, Volume= 0.345 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond DP1 : DP1 off site north

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 263.66' @ 12.76 hrs Surf.Area= 15,693 sf Storage= 2,535 cf

Plug-Flow detention time= 23.1 min calculated for 0.345 af (100% of inflow)
Center-of-Mass det. time= 23.1 min (945.1 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	263.50'	78,050 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.50	15,398	604.0	0	0	15,398
264.00	16,311	613.0	7,926	7,926	16,321
265.00	22,709	720.0	19,422	27,348	27,691
267.00	28,088	734.0	50,702	78,050	29,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	263.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	264.65'	**36.0" Round Culvert X 2.00** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 264.65' / 261.00' S= 0.0652 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf

Discarded OutFlow Max=0.88 cfs @ 12.76 hrs HW=263.66' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.88 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=263.50' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond SFB1: SFB1

Inflow Area = 1.578 ac, 47.53% Impervious, Inflow Depth = 0.44" for 1- Year event
Inflow = 0.59 cfs @ 12.11 hrs, Volume= 0.058 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond UGINFL C : Underground Infil C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 281.02' @ 24.34 hrs Surf.Area= 1,573 sf Storage= 2,537 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	9,927 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
278.50	532	116.0	0	0	532
284.00	3,515	237.0	9,927	9,927	4,067

Device	Routing	Invert	Outlet Devices
#1	Primary	281.80'	**15.0" Round Culvert** L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 281.80' / 278.20' S= 0.0263 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=278.50' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Summary for Pond SFB2: SFB 2

Inflow Area = 1.663 ac, 24.34% Impervious, Inflow Depth = 0.09" for 1- Year event
Inflow = 0.02 cfs @ 13.70 hrs, Volume= 0.012 af
Outflow = 0.01 cfs @ 20.63 hrs, Volume= 0.002 af, Atten= 55%, Lag= 416.0 min
Primary = 0.01 cfs @ 20.63 hrs, Volume= 0.002 af
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 264.00' @ 20.63 hrs Surf.Area= 533 sf Storage= 425 cf

Plug-Flow detention time= 541.3 min calculated for 0.002 af (20% of inflow)

Center-of-Mass det. time= 306.2 min (1,335.0 - 1,028.7)

Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	1,090 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	325	76.0	0	0	325
264.00	533	91.0	425	425	541
265.00	807	111.0	665	1,090	878

Device	Routing	Invert	Outlet Devices
#1	Primary	264.00'	**35.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 20.63 hrs HW=264.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.07 fps)

Summary for Pond UGINFL A: Underground Infil A

Inflow Area = 1.802 ac, 48.39% Impervious, Inflow Depth = 0.41" for 1- Year event
Inflow = 0.43 cfs @ 12.30 hrs, Volume= 0.061 af
Outflow = 0.41 cfs @ 12.40 hrs, Volume= 0.061 af, Atten= 5%, Lag= 5.8 min
Discarded = 0.41 cfs @ 12.40 hrs, Volume= 0.061 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond UGINFL B : Underground Infl B

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.93' @ 12.40 hrs Surf.Area= 0.088 ac Storage= 0.002 af

Plug-Flow detention time= 4.0 min calculated for 0.061 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (922.5 - 918.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	276.90'	0.000 af	**48.00'W x 80.00'L x 5.17'H Field A** 0.455 af Overall - 0.455 af Embedded = 0.000 af x 33.0% Voids
#2A	276.90'	0.353 af	**retain_it upright 4.5'** x 60 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 6 Rows adjusted for 287.0 cf perimeter wall
		0.353 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	276.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	280.60'	**8.0" Round Culvert**

L= 146.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 280.60' / 279.60' S= 0.0068 '/' Cc= 0.900
n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.74 cfs @ 12.40 hrs HW=276.93' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=276.90' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond UGINFL B: Underground Infl B

Inflow Area = 7.882 ac, 54.29% Impervious, Inflow Depth = 0.48" for 1- Year event
Inflow = 2.77 cfs @ 12.25 hrs, Volume= 0.314 af
Outflow = 0.92 cfs @ 12.17 hrs, Volume= 0.314 af, Atten= 67%, Lag= 0.0 min
Discarded = 0.92 cfs @ 12.17 hrs, Volume= 0.314 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond UGINFL C : Underground Infil C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 277.30' @ 12.76 hrs Surf.Area= 0.379 ac Storage= 0.067 af

Plug-Flow detention time= 25.0 min calculated for 0.314 af (100% of inflow)
Center-of-Mass det. time= 25.0 min (915.7 - 890.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	277.10'	0.000 af	**48.00'W x 344.00'L x 4.67'H Field A** 1.769 af Overall - 1.769 af Embedded = 0.000 af x 33.0% Voids
#2A	277.10'	1.351 af	**retain_it upright 4.0'** x 258 Inside #1 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 56.0"H => 37.33 sf x 8.00'L = 298.7 cf 6 Rows adjusted for 739.8 cf perimeter wall
		1.351 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.10'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	280.10'	**10.0" Round Culvert** L= 166.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 280.10' / 278.10' S= 0.0120 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.92 cfs @ 12.17 hrs HW=277.15' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=277.10' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond UGINFL C: Underground Infil C

Inflow Area = 16.052 ac, 50.31% Impervious, Inflow Depth = 0.18" for 1- Year event
Inflow = 1.87 cfs @ 12.21 hrs, Volume= 0.242 af
Outflow = 1.48 cfs @ 12.41 hrs, Volume= 0.242 af, Atten= 21%, Lag= 11.7 min
Discarded = 1.48 cfs @ 12.41 hrs, Volume= 0.242 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond IB : Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 275.05' @ 12.41 hrs Surf.Area= 0.652 ac Storage= 0.022 af

Plug-Flow detention time= 10.8 min calculated for 0.242 af (100% of inflow)
Center-of-Mass det. time= 10.8 min (914.6 - 903.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	275.00'	0.000 af	**96.00'W x 224.00'L x 4.67'H Field A** 2.304 af Overall - 2.304 af Embedded = 0.000 af x 33.0% Voids
#2A	275.00'	1.767 af	**retain_it upright 4.0'** x 336 Inside #1 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 56.0"H => 37.33 sf x 8.00'L = 298.7 cf 12 Rows adjusted for 604.0 cf perimeter wall
#3B	275.00'	0.000 af	**96.00'W x 72.00'L x 5.33'H Field B** 0.846 af Overall - 0.846 af Embedded = 0.000 af x 33.0% Voids
#4B	275.00'	0.565 af	**retain_it inverted 4.0'** x 108 Inside #3 Inside= 84.0"W x 48.0"H => 28.87 sf x 8.00'L = 230.9 cf Outside= 96.0"W x 64.0"H => 42.67 sf x 8.00'L = 341.3 cf 12 Rows adjusted for 317.1 cf perimeter wall
		2.333 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	275.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	277.80'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 277.80' / 277.00' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=1.59 cfs @ 12.41 hrs HW=275.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.59 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.816 ac 59.69% Impervious Runoff Depth=1.10"
Flow Length=464' Tc=16.4 min CN=74 Runoff=3.41 cfs 0.351 af

Subcatchment2: Subcat 2 Runoff Area=2.518 ac 56.75% Impervious Runoff Depth=0.99"
Flow Length=488' Tc=13.5 min CN=72 Runoff=2.13 cfs 0.208 af

Subcatchment2A: Subcat 2A Runoff Area=1.679 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=106' Tc=6.0 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment3: Subcat 3 Runoff Area=2.264 ac 49.89% Impervious Runoff Depth=0.74"
Flow Length=482' Tc=13.7 min CN=67 Runoff=1.29 cfs 0.140 af

Subcatchment4: Subcat 4 Runoff Area=1.802 ac 48.39% Impervious Runoff Depth=0.69"
Flow Length=466' Tc=16.2 min CN=66 Runoff=0.88 cfs 0.104 af

Subcatchment4a: Subcat 4a Runoff Area=1.083 ac 3.14% Impervious Runoff Depth=0.00"
Flow Length=125' Tc=8.3 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment5: Subcat 5 Runoff Area=0.070 ac 0.28% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment6A: Subcat 6A Runoff Area=1.200 ac 23.56% Impervious Runoff Depth=0.17"
Flow Length=372' Tc=8.9 min CN=51 Runoff=0.06 cfs 0.017 af

Subcatchment7: Subcat 7 Runoff Area=1.663 ac 24.34% Impervious Runoff Depth=0.22"
Flow Length=418' Tc=6.0 min CN=53 Runoff=0.14 cfs 0.031 af

Subcatchment9: Subcat 9 Runoff Area=10.952 ac 44.44% Impervious Runoff Depth=0.65"
Flow Length=1,128' Tc=11.0 min CN=65 Runoff=5.58 cfs 0.593 af

Subcatchment10: Subcat 10 Runoff Area=0.977 ac 54.10% Impervious Runoff Depth=0.94"
Tc=6.0 min CN=71 Runoff=0.99 cfs 0.076 af

Subcatchment11: Subcat 11 Runoff Area=3.097 ac 35.18% Impervious Runoff Depth=0.45"
Flow Length=598' Tc=11.1 min CN=60 Runoff=0.83 cfs 0.116 af

Subcatchment12: Subcat 12 Runoff Area=1.578 ac 47.53% Impervious Runoff Depth=0.74"
Flow Length=295' Tc=6.0 min CN=67 Runoff=1.16 cfs 0.097 af

Pond DEP1: Depression 1 Peak Elev=284.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond DEP2: Depression 2 Peak Elev=280.00' Storage=3 cf Inflow=0.06 cfs 0.017 af
Discarded=0.06 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.017 af

Pond DP1: DP1 off site north Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP2: DP-2 Depression NW Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP3: DP 3 Wetland A Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond IB: Infiltration Basin Peak Elev=263.99' Storage=7,710 cf Inflow=5.58 cfs 0.614 af
Discarded=0.91 cfs 0.614 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.614 af

Pond SFB1: SFB1 Peak Elev=281.87' Storage=4,065 cf Inflow=1.16 cfs 0.097 af
15.0" Round Culvert n=0.012 L=137.0' S=0.0263 '/' Outflow=0.02 cfs 0.007 af

Pond SFB2: SFB 2 Peak Elev=264.00' Storage=427 cf Inflow=0.14 cfs 0.031 af
Outflow=0.05 cfs 0.021 af

Pond UGINFL A: Underground Infil A Peak Elev=276.97' Storage=0.005 af Inflow=0.88 cfs 0.104 af
Discarded=0.74 cfs 0.104 af Primary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.104 af

Pond UGINFL B: Underground Infl B Peak Elev=277.54' Storage=0.150 af Inflow=4.69 cfs 0.491 af
Discarded=0.92 cfs 0.491 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 0.491 af

Pond UGINFL C: Underground Infil C Peak Elev=275.15' Storage=0.067 af Inflow=3.63 cfs 0.407 af
Discarded=1.59 cfs 0.407 af Primary=0.00 cfs 0.000 af Outflow=1.59 cfs 0.407 af

Total Runoff Area = 32.698 ac Runoff Volume = 1.734 af Average Runoff Depth = 0.64"
58.21% Pervious = 19.034 ac 41.79% Impervious = 13.664 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.816 ac 59.69% Impervious Runoff Depth=2.21"
Flow Length=464' Tc=16.4 min CN=74 Runoff=7.15 cfs 0.701 af

Subcatchment2: Subcat 2 Runoff Area=2.518 ac 56.75% Impervious Runoff Depth=2.05"
Flow Length=488' Tc=13.5 min CN=72 Runoff=4.67 cfs 0.429 af

Subcatchment2A: Subcat 2A Runoff Area=1.679 ac 0.00% Impervious Runoff Depth=0.04"
Flow Length=106' Tc=6.0 min CN=34 Runoff=0.01 cfs 0.006 af

Subcatchment3: Subcat 3 Runoff Area=2.264 ac 49.89% Impervious Runoff Depth=1.67"
Flow Length=482' Tc=13.7 min CN=67 Runoff=3.30 cfs 0.314 af

Subcatchment4: Subcat 4 Runoff Area=1.802 ac 48.39% Impervious Runoff Depth=1.59"
Flow Length=466' Tc=16.2 min CN=66 Runoff=2.33 cfs 0.239 af

Subcatchment4a: Subcat 4a Runoff Area=1.083 ac 3.14% Impervious Runoff Depth=0.11"
Flow Length=125' Tc=8.3 min CN=37 Runoff=0.02 cfs 0.010 af

Subcatchment5: Subcat 5 Runoff Area=0.070 ac 0.28% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment6A: Subcat 6A Runoff Area=1.200 ac 23.56% Impervious Runoff Depth=0.66"
Flow Length=372' Tc=8.9 min CN=51 Runoff=0.52 cfs 0.066 af

Subcatchment7: Subcat 7 Runoff Area=1.663 ac 24.34% Impervious Runoff Depth=0.77"
Flow Length=418' Tc=6.0 min CN=53 Runoff=1.06 cfs 0.107 af

Subcatchment9: Subcat 9 Runoff Area=10.952 ac 44.44% Impervious Runoff Depth=1.52"
Flow Length=1,128' Tc=11.0 min CN=65 Runoff=15.51 cfs 1.389 af

Subcatchment10: Subcat 10 Runoff Area=0.977 ac 54.10% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=71 Runoff=2.22 cfs 0.160 af

Subcatchment11: Subcat 11 Runoff Area=3.097 ac 35.18% Impervious Runoff Depth=1.19"
Flow Length=598' Tc=11.1 min CN=60 Runoff=3.17 cfs 0.306 af

Subcatchment12: Subcat 12 Runoff Area=1.578 ac 47.53% Impervious Runoff Depth=1.67"
Flow Length=295' Tc=6.0 min CN=67 Runoff=2.96 cfs 0.219 af

Pond DEP1: Depression 1 Peak Elev=284.00' Storage=3 cf Inflow=0.02 cfs 0.010 af
Discarded=0.02 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.010 af

Pond DEP2: Depression 2 Peak Elev=280.00' Storage=27 cf Inflow=0.52 cfs 0.066 af
Discarded=0.51 cfs 0.066 af Primary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.066 af

Pond DP1: DP1 off site north Inflow=1.06 cfs 0.202 af
Primary=1.06 cfs 0.202 af

Pond DP2: DP-2 Depression NW Inflow=0.01 cfs 0.006 af
Primary=0.01 cfs 0.006 af

Pond DP3: DP 3 Wetland A Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond IB: Infiltration Basin Peak Elev=264.91' Storage=25,392 cf Inflow=16.46 cfs 1.486 af
Discarded=1.23 cfs 1.284 af Primary=1.06 cfs 0.202 af Outflow=2.29 cfs 1.486 af

Pond SFB1: SFB1 Peak Elev=282.08' Storage=4,519 cf Inflow=2.96 cfs 0.219 af
15.0" Round Culvert n=0.012 L=137.0' S=0.0263 '/' Outflow=0.38 cfs 0.129 af

Pond SFB2: SFB 2 Peak Elev=264.05' Storage=451 cf Inflow=1.06 cfs 0.107 af
Outflow=0.96 cfs 0.097 af

Pond UGINFL A: Underground Infil A Peak Elev=277.57' Storage=0.053 af Inflow=2.33 cfs 0.239 af
Discarded=0.74 cfs 0.239 af Primary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.239 af

Pond UGINFL B: Underground Infl B Peak Elev=278.47' Storage=0.462 af Inflow=10.39 cfs 1.016 af
Discarded=0.92 cfs 1.016 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 1.016 af

Pond UGINFL C: Underground Infil C Peak Elev=275.69' Storage=0.306 af Inflow=9.39 cfs 1.024 af
Discarded=1.59 cfs 1.024 af Primary=0.00 cfs 0.000 af Outflow=1.59 cfs 1.024 af

Total Runoff Area = 32.698 ac Runoff Volume = 3.946 af Average Runoff Depth = 1.45"
58.21% Pervious = 19.034 ac 41.79% Impervious = 13.664 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.816 ac 59.69% Impervious Runoff Depth=3.35"
Flow Length=464' Tc=16.4 min CN=74 Runoff=10.97 cfs 1.066 af

Subcatchment2: Subcat 2 Runoff Area=2.518 ac 56.75% Impervious Runoff Depth=3.16"
Flow Length=488' Tc=13.5 min CN=72 Runoff=7.32 cfs 0.662 af

Subcatchment2A: Subcat 2A Runoff Area=1.679 ac 0.00% Impervious Runoff Depth=0.25"
Flow Length=106' Tc=6.0 min CN=34 Runoff=0.08 cfs 0.035 af

Subcatchment3: Subcat 3 Runoff Area=2.264 ac 49.89% Impervious Runoff Depth=2.68"
Flow Length=482' Tc=13.7 min CN=67 Runoff=5.49 cfs 0.506 af

Subcatchment4: Subcat 4 Runoff Area=1.802 ac 48.39% Impervious Runoff Depth=2.59"
Flow Length=466' Tc=16.2 min CN=66 Runoff=3.94 cfs 0.389 af

Subcatchment4a: Subcat 4a Runoff Area=1.083 ac 3.14% Impervious Runoff Depth=0.39"
Flow Length=125' Tc=8.3 min CN=37 Runoff=0.15 cfs 0.036 af

Subcatchment5: Subcat 5 Runoff Area=0.070 ac 0.28% Impervious Runoff Depth=0.09"
Tc=0.0 min CN=30 Runoff=0.00 cfs 0.001 af

Subcatchment6A: Subcat 6A Runoff Area=1.200 ac 23.56% Impervious Runoff Depth=1.32"
Flow Length=372' Tc=8.9 min CN=51 Runoff=1.38 cfs 0.132 af

Subcatchment7: Subcat 7 Runoff Area=1.663 ac 24.34% Impervious Runoff Depth=1.47"
Flow Length=418' Tc=6.0 min CN=53 Runoff=2.50 cfs 0.204 af

Subcatchment9: Subcat 9 Runoff Area=10.952 ac 44.44% Impervious Runoff Depth=2.50"
Flow Length=1,128' Tc=11.0 min CN=65 Runoff=26.56 cfs 2.280 af

Subcatchment10: Subcat 10 Runoff Area=0.977 ac 54.10% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=71 Runoff=3.50 cfs 0.249 af

Subcatchment11: Subcat 11 Runoff Area=3.097 ac 35.18% Impervious Runoff Depth=2.05"
Flow Length=598' Tc=11.1 min CN=60 Runoff=5.95 cfs 0.530 af

Subcatchment12: Subcat 12 Runoff Area=1.578 ac 47.53% Impervious Runoff Depth=2.68"
Flow Length=295' Tc=6.0 min CN=67 Runoff=4.91 cfs 0.353 af

Pond DEP1: Depression 1 Peak Elev=284.02' Storage=34 cf Inflow=0.15 cfs 0.036 af
Discarded=0.12 cfs 0.036 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.036 af

Pond DEP2: Depression 2 Peak Elev=280.01' Storage=84 cf Inflow=1.38 cfs 0.132 af
Discarded=1.28 cfs 0.132 af Primary=0.00 cfs 0.000 af Outflow=1.28 cfs 0.132 af

Pond DP1: DP1 off site north Inflow=7.99 cfs 0.948 af
Primary=7.99 cfs 0.948 af

Pond DP2: DP-2 Depression NW Inflow=0.08 cfs 0.035 af
Primary=0.08 cfs 0.035 af

Pond DP3: DP 3 Wetland A Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond IB: Infiltration Basin Peak Elev=265.39' Storage=36,453 cf Inflow=28.69 cfs 2.474 af
Discarded=1.32 cfs 1.526 af Primary=7.99 cfs 0.948 af Outflow=9.32 cfs 2.474 af

Pond SFB1: SFB1 Peak Elev=282.49' Storage=5,462 cf Inflow=4.91 cfs 0.353 af
15.0" Round Culvert n=0.012 L=137.0' S=0.0263 '/' Outflow=1.97 cfs 0.263 af

Pond SFB2: SFB 2 Peak Elev=264.09' Storage=475 cf Inflow=2.50 cfs 0.204 af
Outflow=2.49 cfs 0.194 af

Pond UGINFL A: Underground Infil A Peak Elev=278.46' Storage=0.122 af Inflow=3.94 cfs 0.389 af
Discarded=0.74 cfs 0.389 af Primary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.389 af

Pond UGINFL B: Underground Infl B Peak Elev=279.64' Storage=0.858 af Inflow=16.36 cfs 1.572 af
Discarded=0.92 cfs 1.572 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 1.572 af

Pond UGINFL C: Underground Infil C Peak Elev=276.42' Storage=0.735 af Inflow=16.51 cfs 1.704 af
Discarded=1.59 cfs 1.704 af Primary=0.00 cfs 0.000 af Outflow=1.59 cfs 1.704 af

Total Runoff Area = 32.698 ac Runoff Volume = 6.442 af Average Runoff Depth = 2.36"
58.21% Pervious = 19.034 ac 41.79% Impervious = 13.664 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.816 ac 59.69% Impervious Runoff Depth=5.56"
Flow Length=464' Tc=16.4 min CN=74 Runoff=18.12 cfs 1.767 af

Subcatchment2: Subcat 2 Runoff Area=2.518 ac 56.75% Impervious Runoff Depth=5.31"
Flow Length=488' Tc=13.5 min CN=72 Runoff=12.34 cfs 1.115 af

Subcatchment2A: Subcat 2A Runoff Area=1.679 ac 0.00% Impervious Runoff Depth=0.96"
Flow Length=106' Tc=6.0 min CN=34 Runoff=0.90 cfs 0.134 af

Subcatchment3: Subcat 3 Runoff Area=2.264 ac 49.89% Impervious Runoff Depth=4.71"
Flow Length=482' Tc=13.7 min CN=67 Runoff=9.79 cfs 0.888 af

Subcatchment4: Subcat 4 Runoff Area=1.802 ac 48.39% Impervious Runoff Depth=4.59"
Flow Length=466' Tc=16.2 min CN=66 Runoff=7.12 cfs 0.689 af

Subcatchment4a: Subcat 4a Runoff Area=1.083 ac 3.14% Impervious Runoff Depth=1.26"
Flow Length=125' Tc=8.3 min CN=37 Runoff=0.94 cfs 0.113 af

Subcatchment5: Subcat 5 Runoff Area=0.070 ac 0.28% Impervious Runoff Depth=0.59"
Tc=0.0 min CN=30 Runoff=0.02 cfs 0.003 af

Subcatchment6A: Subcat 6A Runoff Area=1.200 ac 23.56% Impervious Runoff Depth=2.80"
Flow Length=372' Tc=8.9 min CN=51 Runoff=3.37 cfs 0.280 af

Subcatchment7: Subcat 7 Runoff Area=1.663 ac 24.34% Impervious Runoff Depth=3.04"
Flow Length=418' Tc=6.0 min CN=53 Runoff=5.69 cfs 0.421 af

Subcatchment9: Subcat 9 Runoff Area=10.952 ac 44.44% Impervious Runoff Depth=4.47"
Flow Length=1,128' Tc=11.0 min CN=65 Runoff=48.50 cfs 4.077 af

Subcatchment10: Subcat 10 Runoff Area=0.977 ac 54.10% Impervious Runoff Depth=5.19"
Tc=6.0 min CN=71 Runoff=5.95 cfs 0.423 af

Subcatchment11: Subcat 11 Runoff Area=3.097 ac 35.18% Impervious Runoff Depth=3.87"
Flow Length=598' Tc=11.1 min CN=60 Runoff=11.71 cfs 0.998 af

Subcatchment12: Subcat 12 Runoff Area=1.578 ac 47.53% Impervious Runoff Depth=4.71"
Flow Length=295' Tc=6.0 min CN=67 Runoff=8.72 cfs 0.619 af

Pond DEP1: Depression 1 Peak Elev=284.27' Storage=949 cf Inflow=0.94 cfs 0.113 af
Discarded=0.29 cfs 0.113 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.113 af

Pond DEP2: Depression 2 Peak Elev=280.23' Storage=1,636 cf Inflow=3.37 cfs 0.280 af
Discarded=1.44 cfs 0.280 af Primary=0.00 cfs 0.000 af Outflow=1.44 cfs 0.280 af

Pond DP1: DP1 off site north Inflow=27.75 cfs 3.180 af
Primary=27.75 cfs 3.180 af

Pond DP2: DP-2 Depression NW Inflow=0.90 cfs 0.134 af
Primary=0.90 cfs 0.134 af

Pond DP3: DP 3 Wetland A Inflow=0.02 cfs 0.003 af
Primary=0.02 cfs 0.003 af

Pond DP4: DP 4 Wetland E Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond IB: Infiltration Basin Peak Elev=266.10' Storage=53,896 cf Inflow=53.22 cfs 5.034 af
Discarded=1.43 cfs 1.854 af Primary=27.75 cfs 3.180 af Outflow=29.18 cfs 5.034 af

Pond SFB1: SFB1 Peak Elev=283.24' Storage=7,472 cf Inflow=8.72 cfs 0.619 af
15.0" Round Culvert n=0.012 L=137.0' S=0.0263 '/' Outflow=5.33 cfs 0.529 af

Pond SFB2: SFB 2 Peak Elev=264.16' Storage=513 cf Inflow=5.69 cfs 0.421 af
Outflow=5.68 cfs 0.411 af

Pond UGINFL A: Underground Infil A Peak Elev=280.55' Storage=0.287 af Inflow=7.12 cfs 0.689 af
Discarded=0.74 cfs 0.689 af Primary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.689 af

Pond UGINFL B: Underground Infl B Peak Elev=281.05' Storage=1.334 af Inflow=27.72 cfs 2.655 af
Discarded=0.92 cfs 2.036 af Primary=1.92 cfs 0.619 af Outflow=2.84 cfs 2.655 af

Pond UGINFL C: Underground Infil C Peak Elev=278.50' Storage=1.948 af Inflow=33.48 cfs 3.684 af
Discarded=1.59 cfs 3.138 af Primary=1.68 cfs 0.546 af Outflow=3.27 cfs 3.684 af

Total Runoff Area = 32.698 ac Runoff Volume = 11.528 af Average Runoff Depth = 4.23"
58.21% Pervious = 19.034 ac 41.79% Impervious = 13.664 ac

Hydrograph for Pond DEP1: Depression 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	284.00	0.00	0.00	**0.00**
1.00	0.00	0	284.00	0.00	0.00	0.00
2.00	0.00	0	284.00	0.00	0.00	0.00
3.00	0.00	0	284.00	0.00	0.00	0.00
4.00	0.00	1	284.00	0.00	0.00	0.00
5.00	0.00	1	284.00	0.00	0.00	0.00
6.00	0.00	1	284.00	0.00	0.00	0.00
7.00	0.01	1	284.00	0.01	0.01	0.00
8.00	0.01	1	284.00	0.01	0.01	0.00
9.00	0.01	2	284.00	0.01	0.01	0.00
10.00	0.01	2	284.00	0.01	0.01	0.00
11.00	0.02	4	284.00	0.02	0.02	0.00
12.00	**0.17**	**23**	**284.01**	**0.12**	**0.12**	0.00
13.00	**0.21**	**843**	**284.25**	**0.27**	**0.27**	0.00
14.00	0.15	565	284.19	0.23	0.23	0.00
15.00	0.12	314	284.12	0.18	0.18	0.00
16.00	0.09	118	284.05	0.14	0.14	0.00
17.00	0.07	13	284.01	0.07	0.07	0.00
18.00	0.06	10	284.00	0.06	0.06	0.00
19.00	0.05	9	284.00	0.05	0.05	0.00
20.00	0.05	8	284.00	0.05	0.05	0.00
21.00	0.04	8	284.00	0.04	0.04	0.00
22.00	0.04	7	284.00	0.04	0.04	0.00
23.00	0.04	6	284.00	0.04	0.04	0.00
24.00	0.03	6	284.00	0.03	0.03	0.00
25.00	0.00	0	284.00	0.00	0.00	0.00
26.00	0.00	0	284.00	0.00	0.00	0.00
27.00	0.00	0	284.00	0.00	0.00	0.00
28.00	0.00	0	284.00	0.00	0.00	0.00
29.00	0.00	0	284.00	0.00	0.00	0.00
30.00	0.00	0	284.00	0.00	0.00	0.00
31.00	0.00	0	284.00	0.00	0.00	0.00
32.00	0.00	0	284.00	0.00	0.00	0.00
33.00	0.00	0	284.00	0.00	0.00	0.00
34.00	0.00	0	284.00	0.00	0.00	0.00
35.00	0.00	0	284.00	0.00	0.00	0.00
36.00	0.00	0	284.00	0.00	0.00	0.00
37.00	0.00	0	284.00	0.00	0.00	0.00
38.00	0.00	0	284.00	0.00	0.00	0.00
39.00	0.00	0	284.00	0.00	0.00	0.00
40.00	0.00	0	284.00	0.00	0.00	0.00
41.00	0.00	0	284.00	0.00	0.00	0.00
42.00	0.00	0	284.00	0.00	0.00	0.00
43.00	0.00	0	284.00	0.00	0.00	0.00
44.00	0.00	0	284.00	0.00	0.00	0.00
45.00	0.00	0	284.00	0.00	0.00	0.00
46.00	0.00	0	284.00	0.00	0.00	0.00
47.00	0.00	0	284.00	0.00	0.00	0.00
48.00	0.00	0	284.00	0.00	0.00	0.00

Hydrograph for Pond DEP2: Depression 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	280.00	0.00	0.00	**0.00**
1.00	0.01	0	280.00	0.01	0.01	0.00
2.00	0.02	1	280.00	0.01	0.01	0.00
3.00	0.02	1	280.00	0.02	0.02	0.00
4.00	0.03	1	280.00	0.03	0.03	0.00
5.00	0.03	2	280.00	0.03	0.03	0.00
6.00	0.04	2	280.00	0.04	0.04	0.00
7.00	0.05	2	280.00	0.05	0.05	0.00
8.00	0.06	3	280.00	0.06	0.06	0.00
9.00	0.09	5	280.00	0.09	0.09	0.00
10.00	0.12	6	280.00	0.12	0.12	0.00
11.00	0.17	9	280.00	0.17	0.17	0.00
12.00	**1.30**	**62**	**280.01**	**1.19**	**1.19**	0.00
13.00	**0.40**	**21**	**280.00**	**0.41**	**0.41**	0.00
14.00	0.26	14	280.00	0.26	0.26	0.00
15.00	0.20	11	280.00	0.21	0.21	0.00
16.00	0.15	8	280.00	0.15	0.15	0.00
17.00	0.12	6	280.00	0.12	0.12	0.00
18.00	0.09	5	280.00	0.09	0.09	0.00
19.00	0.08	4	280.00	0.08	0.08	0.00
20.00	0.07	4	280.00	0.08	0.08	0.00
21.00	0.07	4	280.00	0.07	0.07	0.00
22.00	0.06	3	280.00	0.06	0.06	0.00
23.00	0.06	3	280.00	0.06	0.06	0.00
24.00	0.05	3	280.00	0.05	0.05	0.00
25.00	0.00	0	280.00	0.00	0.00	0.00
26.00	0.00	0	280.00	0.00	0.00	0.00
27.00	0.00	0	280.00	0.00	0.00	0.00
28.00	0.00	0	280.00	0.00	0.00	0.00
29.00	0.00	0	280.00	0.00	0.00	0.00
30.00	0.00	0	280.00	0.00	0.00	0.00
31.00	0.00	0	280.00	0.00	0.00	0.00
32.00	0.00	0	280.00	0.00	0.00	0.00
33.00	0.00	0	280.00	0.00	0.00	0.00
34.00	0.00	0	280.00	0.00	0.00	0.00
35.00	0.00	0	280.00	0.00	0.00	0.00
36.00	0.00	0	280.00	0.00	0.00	0.00
37.00	0.00	0	280.00	0.00	0.00	0.00
38.00	0.00	0	280.00	0.00	0.00	0.00
39.00	0.00	0	280.00	0.00	0.00	0.00
40.00	0.00	0	280.00	0.00	0.00	0.00
41.00	0.00	0	280.00	0.00	0.00	0.00
42.00	0.00	0	280.00	0.00	0.00	0.00
43.00	0.00	0	280.00	0.00	0.00	0.00
44.00	0.00	0	280.00	0.00	0.00	0.00
45.00	0.00	0	280.00	0.00	0.00	0.00
46.00	0.00	0	280.00	0.00	0.00	0.00
47.00	0.00	0	280.00	0.00	0.00	0.00
48.00	0.00	0	280.00	0.00	0.00	0.00

Hydrograph for Pond IB: Infiltration Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	263.50	0.00	0.00	0.00
1.00	0.11	44	263.50	0.06	0.06	0.00
2.00	0.26	173	263.51	0.23	0.23	0.00
3.00	0.36	253	263.52	0.34	0.34	0.00
4.00	0.46	327	263.52	0.44	0.44	0.00
5.00	0.59	405	263.53	0.55	0.55	0.00
6.00	0.68	489	263.53	0.66	0.66	0.00
7.00	0.89	623	263.54	0.84	0.84	0.00
8.00	1.13	1,138	263.57	0.87	0.87	0.00
9.00	1.61	2,855	263.68	0.88	0.88	0.00
10.00	2.15	6,423	263.91	0.90	0.90	0.00
11.00	3.16	12,476	264.27	1.00	1.00	0.00
12.00	**21.70**	**32,273**	**265.21**	**6.02**	**1.30**	**4.72**
13.00	**5.75**	**37,200**	**265.42**	**9.98**	**1.33**	**8.65**
14.00	3.68	30,070	265.12	4.58	1.28	3.29
15.00	3.27	28,213	265.04	3.55	1.27	2.27
16.00	2.64	27,122	264.99	3.02	1.26	1.76
17.00	2.07	25,769	264.93	2.44	1.24	1.20
18.00	1.49	24,332	264.86	1.92	1.22	0.71
19.00	1.15	22,852	264.80	1.52	1.19	0.33
20.00	0.97	21,613	264.74	1.29	1.17	0.12
21.00	0.89	20,540	264.69	1.17	1.15	0.03
22.00	0.81	19,462	264.63	1.13	1.13	0.00
23.00	0.73	18,198	264.57	1.11	1.11	0.00
24.00	0.65	16,734	264.49	1.08	1.08	0.00
25.00	0.00	13,330	264.31	1.02	1.02	0.00
26.00	0.00	9,798	264.11	0.95	0.95	0.00
27.00	0.00	6,492	263.91	0.90	0.90	0.00
28.00	0.00	3,286	263.71	0.88	0.88	0.00
29.00	0.00	299	263.52	0.40	0.40	0.00
30.00	0.00	2	263.50	0.00	0.00	0.00
31.00	0.00	0	263.50	0.00	0.00	0.00
32.00	0.00	0	263.50	0.00	0.00	0.00
33.00	0.00	0	263.50	0.00	0.00	0.00
34.00	0.00	0	263.50	0.00	0.00	0.00
35.00	0.00	0	263.50	0.00	0.00	0.00
36.00	0.00	0	263.50	0.00	0.00	0.00
37.00	0.00	0	263.50	0.00	0.00	0.00
38.00	0.00	0	263.50	0.00	0.00	0.00
39.00	0.00	0	263.50	0.00	0.00	0.00
40.00	0.00	0	263.50	0.00	0.00	0.00
41.00	0.00	0	263.50	0.00	0.00	0.00
42.00	0.00	0	263.50	0.00	0.00	0.00
43.00	0.00	0	263.50	0.00	0.00	0.00
44.00	0.00	0	263.50	0.00	0.00	0.00
45.00	0.00	0	263.50	0.00	0.00	0.00
46.00	0.00	0	263.50	0.00	0.00	0.00
47.00	0.00	0	263.50	0.00	0.00	0.00
48.00	0.00	0	263.50	0.00	0.00	0.00

Hydrograph for Pond UGINFL A: Underground Infil A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	276.90	0.00	0.00	**0.00**
1.00	0.02	3	276.90	0.01	0.01	0.00
2.00	0.04	10	276.90	0.04	0.04	0.00
3.00	0.06	15	276.90	0.06	0.06	0.00
4.00	0.08	19	276.91	0.08	0.08	0.00
5.00	0.10	23	276.91	0.10	0.10	0.00
6.00	0.11	26	276.91	0.11	0.11	0.00
7.00	0.14	34	276.91	0.14	0.14	0.00
8.00	0.18	43	276.91	0.18	0.18	0.00
9.00	0.26	61	276.92	0.25	0.25	0.00
10.00	0.35	82	276.92	0.34	0.34	0.00
11.00	0.51	119	276.93	**0.50**	**0.50**	0.00
12.00	**2.69**	1,305	277.28	**0.74**	**0.74**	0.00
13.00	**0.98**	**10,183**	**279.88**	0.74	0.74	0.00
14.00	0.56	**10,061**	**279.84**	0.74	0.74	0.00
15.00	0.42	9,145	279.58	0.74	0.74	0.00
16.00	0.31	7,808	279.18	0.74	0.74	0.00
17.00	0.24	6,118	278.69	0.74	0.74	0.00
18.00	0.19	4,233	278.14	0.74	0.74	0.00
19.00	0.16	2,199	277.54	0.74	0.74	0.00
20.00	0.15	120	276.94	0.50	0.50	0.00
21.00	0.13	32	276.91	0.13	0.13	0.00
22.00	0.12	29	276.91	0.12	0.12	0.00
23.00	0.11	26	276.91	0.11	0.11	0.00
24.00	0.10	24	276.91	0.10	0.10	0.00
25.00	0.00	0	276.90	0.00	0.00	0.00
26.00	0.00	0	276.90	0.00	0.00	0.00
27.00	0.00	0	276.90	0.00	0.00	0.00
28.00	0.00	0	276.90	0.00	0.00	0.00
29.00	0.00	0	276.90	0.00	0.00	0.00
30.00	0.00	0	276.90	0.00	0.00	0.00
31.00	0.00	0	276.90	0.00	0.00	0.00
32.00	0.00	0	276.90	0.00	0.00	0.00
33.00	0.00	0	276.90	0.00	0.00	0.00
34.00	0.00	0	276.90	0.00	0.00	0.00
35.00	0.00	0	276.90	0.00	0.00	0.00
36.00	0.00	0	276.90	0.00	0.00	0.00
37.00	0.00	0	276.90	0.00	0.00	0.00
38.00	0.00	0	276.90	0.00	0.00	0.00
39.00	0.00	0	276.90	0.00	0.00	0.00
40.00	0.00	0	276.90	0.00	0.00	0.00
41.00	0.00	0	276.90	0.00	0.00	0.00
42.00	0.00	0	276.90	0.00	0.00	0.00
43.00	0.00	0	276.90	0.00	0.00	0.00
44.00	0.00	0	276.90	0.00	0.00	0.00
45.00	0.00	0	276.90	0.00	0.00	0.00
46.00	0.00	0	276.90	0.00	0.00	0.00
47.00	0.00	0	276.90	0.00	0.00	0.00
48.00	0.00	0	276.90	0.00	0.00	0.00

Hydrograph for Pond UGINFL B: Underground Infl B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	277.10	0.00	0.00	0.00
1.00	0.06	24	277.10	0.03	0.03	0.00
2.00	0.17	117	277.11	0.16	0.16	0.00
3.00	0.25	174	277.11	0.23	0.23	0.00
4.00	0.32	226	277.12	0.30	0.30	0.00
5.00	0.38	273	277.12	0.37	0.37	0.00
6.00	0.43	315	277.12	0.42	0.42	0.00
7.00	0.56	396	277.13	0.53	0.53	0.00
8.00	0.72	510	277.13	0.68	**0.68**	0.00
9.00	1.01	707	277.15	0.92	**0.92**	0.00
10.00	1.36	1,670	277.21	0.92	0.92	0.00
11.00	1.99	4,279	277.39	0.92	0.92	0.00
12.00	**10.83**	15,036	278.12	0.92	0.92	0.00
13.00	**3.56**	**53,896**	**280.76**	**2.21**	0.92	**1.29**
14.00	2.05	**54,645**	**280.81**	**2.35**	0.92	**1.43**
15.00	1.53	53,016	280.70	2.04	0.92	1.12
16.00	1.11	51,093	280.57	1.67	0.92	0.75
17.00	0.86	49,177	280.44	1.34	0.92	0.42
18.00	0.67	47,524	280.33	1.12	0.92	0.20
19.00	0.58	45,977	280.23	0.98	0.92	0.06
20.00	0.53	44,558	280.13	0.92	0.92	0.00
21.00	0.48	43,049	280.03	0.92	0.92	0.00
22.00	0.44	41,385	279.91	0.92	0.92	0.00
23.00	0.39	39,566	279.79	0.92	0.92	0.00
24.00	0.35	37,589	279.66	0.92	0.92	0.00
25.00	0.00	34,570	279.45	0.92	0.92	0.00
26.00	0.00	31,254	279.22	0.92	0.92	0.00
27.00	0.00	27,938	279.00	0.92	0.92	0.00
28.00	0.00	24,622	278.77	0.92	0.92	0.00
29.00	0.00	21,305	278.55	0.92	0.92	0.00
30.00	0.00	17,989	278.32	0.92	0.92	0.00
31.00	0.00	14,673	278.10	0.92	0.92	0.00
32.00	0.00	11,357	277.87	0.92	0.92	0.00
33.00	0.00	8,041	277.65	0.92	0.92	0.00
34.00	0.00	4,725	277.42	0.92	0.92	0.00
35.00	0.00	1,408	277.20	0.92	0.92	0.00
36.00	0.00	16	277.10	0.02	0.02	0.00
37.00	0.00	0	277.10	0.00	0.00	0.00
38.00	0.00	0	277.10	0.00	0.00	0.00
39.00	0.00	0	277.10	0.00	0.00	0.00
40.00	0.00	0	277.10	0.00	0.00	0.00
41.00	0.00	0	277.10	0.00	0.00	0.00
42.00	0.00	0	277.10	0.00	0.00	0.00
43.00	0.00	0	277.10	0.00	0.00	0.00
44.00	0.00	0	277.10	0.00	0.00	0.00
45.00	0.00	0	277.10	0.00	0.00	0.00
46.00	0.00	0	277.10	0.00	0.00	0.00
47.00	0.00	0	277.10	0.00	0.00	0.00
48.00	0.00	0	277.10	0.00	0.00	0.00

Hydrograph for Pond UGINFL C: Underground Infil C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	275.00	0.00	0.00	0.00
1.00	0.07	25	275.00	0.04	0.04	0.00
2.00	0.16	95	275.00	0.15	0.15	0.00
3.00	0.23	139	275.01	0.22	0.22	0.00
4.00	0.29	179	275.01	0.28	0.28	0.00
5.00	0.34	215	275.01	0.33	0.33	0.00
6.00	0.39	247	275.01	0.38	0.38	0.00
7.00	0.51	315	275.02	0.49	0.49	0.00
8.00	0.65	404	275.02	0.62	0.62	0.00
9.00	0.93	565	275.03	0.87	0.87	0.00
10.00	1.24	766	275.04	1.18	**1.18**	0.00
11.00	2.22	1,646	275.09	1.59	**1.59**	0.00
12.00	**15.07**	13,518	275.69	1.59	1.59	0.00
13.00	**5.48**	59,915	277.52	1.59	1.59	0.00
14.00	3.95	70,584	277.94	1.67	1.59	0.09
15.00	3.03	**76,229**	**278.16**	**2.11**	1.59	**0.53**
16.00	2.13	**77,533**	**278.21**	**2.26**	1.59	**0.67**
17.00	1.51	76,076	278.16	2.10	1.59	0.51
18.00	1.05	73,528	278.06	1.86	1.59	0.28
19.00	0.80	70,467	277.94	1.67	1.59	0.08
20.00	0.67	67,278	277.81	1.59	1.59	0.00
21.00	0.61	63,867	277.68	1.59	1.59	0.00
22.00	0.56	60,259	277.53	1.59	1.59	0.00
23.00	0.50	56,454	277.38	1.59	1.59	0.00
24.00	0.45	52,451	277.23	1.59	1.59	0.00
25.00	0.02	47,139	277.02	1.59	1.59	0.00
26.00	0.01	41,483	276.79	1.59	1.59	0.00
27.00	0.01	35,805	276.57	1.59	1.59	0.00
28.00	0.00	30,117	276.35	1.59	1.59	0.00
29.00	0.00	24,421	276.12	1.59	1.59	0.00
30.00	0.00	18,721	275.90	1.59	1.59	0.00
31.00	0.00	13,018	275.67	1.59	1.59	0.00
32.00	0.00	7,314	275.38	1.59	1.59	0.00
33.00	0.00	1,608	275.08	1.59	1.59	0.00
34.00	0.00	7	275.00	0.01	0.01	0.00
35.00	0.00	0	275.00	0.00	0.00	0.00
36.00	0.00	0	275.00	0.00	0.00	0.00
37.00	0.00	0	275.00	0.00	0.00	0.00
38.00	0.00	0	275.00	0.00	0.00	0.00
39.00	0.00	0	275.00	0.00	0.00	0.00
40.00	0.00	0	275.00	0.00	0.00	0.00
41.00	0.00	0	275.00	0.00	0.00	0.00
42.00	0.00	0	275.00	0.00	0.00	0.00
43.00	0.00	0	275.00	0.00	0.00	0.00
44.00	0.00	0	275.00	0.00	0.00	0.00
45.00	0.00	0	275.00	0.00	0.00	0.00
46.00	0.00	0	275.00	0.00	0.00	0.00
47.00	0.00	0	275.00	0.00	0.00	0.00
48.00	0.00	0	275.00	0.00	0.00	0.00

Appendix F – Minimum Standard 6 – Redevelopment and Infill Calculations

Version: 4/2015

Project Name: The Dunes

Date: 9/21/2026

Water Quality Volume Calculation WorkSheet

This worksheet is designed to assist the project engineer with a determination of the required water quality treatment area. The worksheet leads the designer through redevelopment applicability first and then receiving water requirements. This tool is intended to compliment to the Redevelopment Criteria Guidance and the Water Quality Guidance and assist both the designer and the permit application reviewer towards consistent results. Enter information into only the YELLOW Boxes.

Redevelopment Criteria Guidance

Water Quality Goals "Stormwater Compensation Method"

Step 1 - Determine which office in OWR you are applying to: Application Guidance

Step 2 - Site Information

		value/calculation	units
Total Site Area (total area of project parcels)	TSA=	32.60	acres
Total Jurisdictional Wetlands and/or floodplain within the above TSA	JW1=	7.75	acres
Existing impervious also within the Jurisdictonal Wetlands	JW2=		acres
Conservation Land within the TSA	CL=		acres
Site Size = (TSA)-(JW1-JW2)-CL	**SS=**	**24.85**	acres

Step 3 - Redevelopment Applicability

Total Impervious Area (pre-construction)	TIA=	0.00	acres
% Impervious (if ≥40% - redevelopment standard 3.2.6 applies)		**0.00**	

REPEAT IF NECESSARY Steps 4, 5 and 6 for EACH Waterbody ID (RIVER-ID as found in the GIS Map Server)

Step 4 - Receiving waterbody information

Waterbody ID or RIVER ID from GIS Map Server	
Waterbody Name from GIS Map Server	
Name the sub-watersheds (design-points) contributing to this Waterbody ID	
Is this Waterbody Impaired/TMDL for any Phosphorus, Metals or Bacteria?	YES
Is this Waterbody Impaired for Nitrogen?	NO

Step 5 - Pre-Post Construction Conditions to the Waterbody

Total Pre-Construction Impervious Surface to this Waterbody ID	0.00	acres
Total Disturbed Existing Impervious (DI)	0.00	acres
Total Post-Construction Impervious to this Waterbody ID	13.80	acres
Net Increased Impervious (NII)	13.80	acres

Step 6 - Infiltration and BMP information - Note: Increasing infiltration will likely decrease stormwater treatment area for Metals, Bacteria and Phosporus

I am proposing to infiltrate this percentage WQv to this WBID	100%	%
I am proposing this number of BMP's	4	#

RESULTS - Select the Larger Number of the 2 numbers provided

Applicable Condition	Min Water Quality Treatment Area	Min Treatment w/o WQ consideration
No Impairement or TMDL - New Development		
No Impairment or TMDL - Redevelopment		
Only Phosphorus, Metals or Bacteria Impairment - New Development	13.80	13.80
Only Phosphorus, Metals or Bacteria Impairment - Redevelopment		
Nitrogen Impairment - New Development		
Nitrogen Impairment - Redevelopment		
REQUIRED STORMWATER TREATMENT AREA	**13.8** acres	

* Enter the name of the STP (both type and label) which has been designed to treat this particular Rev or Rea.

Appendix G – Minimum Standard 7 and 11 – Stormwater Management System Operation and Maintenance Plan and Source Control and Pollution Prevention Plan (Bound Separately)

Appendix H – Minimum Standard 10 – Soil Erosion and Sediment Control Plan (Bound Separately)

Appendix I – Soils Information

- Test Pit Logs
- NRCS Soils Data

Project: 203208 CNE Multi-Family Res
Location: Coventry, RI
Date: 8/12 and 13/2026

Soil Profile Descriptions

Soil Evaluators:	Jeff Peterson*	Tim Piacentini	Total Depth: 107"
License #:	D4039		Free Water Depth: Not observed
Test Hole:	Test Pit 1		Seasonal High Water Table: 80"
Date	8/12/2026		Notes:

27 APPROX SHWT ELEVATION = 273.9 (EX=280.6 PR=283.7)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-9	^C1	abrupt	smooth	2.5Y 5/3	-	-	-	-	very gravelly loamy sand	weak medium platy	very friable	few fine roots
9-22	^Cu2	abrupt	smooth	10YR 4/3 & 3/3 (mixed)	a) 10YR 5/6 conc. b) 7.5YR 5/8 conc,	a) common b) few	a) fine b)fine	a) b) distinct	gravelly sandy loam	massive	friable	fragments of brick and asphalt and an oil can.
22-24	^C3	abrupt	smooth	5Y 4/1 with masses of 5Y 5/1	-	-	-	-	sandy loam	weak medium to fine subangular blocky	friable	few fine relic roots
24-28	^A	abrupt	smooth	10YR 3/3	7.5YR 4/6 mottles	few	fine	distinct	fine sandy loam	weak medium to fine subangular blocky	friable	7.5YR 4/6 iron coatings on coarse fragmentsmay not be indicative of present SHWT in this regraded and filled
28-37	C/A	abrupt	smooth	2.5Y 5/3 with inclusions of 10YR 4/3	-	-	-	-	fine sandy loam	massive	friable	-
37-40	2C4	abrupt	smooth	2.5Y 6/3	-	-	-	-	gravelly coarse sand	single grain	loose	-
40-69	2C5	abrupt	smooth	2.5Y 6/2	-	-	-	-	fine sand	single grain	loose	-
69-80	2C6	abrupt	smooth	2.5Y 7/2	-	-	-	-	fine sand	single grain	loose	-
80-107	2C7	-	-	2.5Y 6/1	7.5YR 4/4 concentrations	common	fine to medium	prominent	loamy fine sand	single grain	loose	-

Soil Evaluators:	Jeff Peterson*	Tim Piacentini	Total Depth: 98"
License #:	D4039		Free Water Depth: 97"
Test Hole:	Test Pit 2		Seasonal High Water Table: 76"
Date	8/12/2026		Notes: Excavation terminated at 98" due to pit sidewall instability.

23 APPROX SHWT ELEVATION = 274.1 (EX=280.4 PR283.0)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-19	BC	abrupt	smooth	2.5Y 5/3	-	-	-	-	loamy fine sand	massive	very friable	few fine roots. Pit located in a c
19-76	C1	clear	smooth	2.5Y 6/3	-	-	-	-	loamy fine sand	massive	very friable	-
76-98	C2	-	-	2.5Y 6/1	2.5Y 5/2 depletions	common	medium	faint	loamy fine sand	massive	very friable	free water observed at 97"

Project: 203208 CNE Multi-Family Res
Location: Coventry, RI
Date: 8/12 and 13/2026

Soil Profile Descriptions

Soil Evaluators:	Jeff Peterson*	Tim Piacentini	Total Depth: 134"
License #:	D4039		Free Water Depth: 132"
Test Hole:	Test Pit 3		Seasonal High Water Table: 92"
Date	8/12/2026		Notes:

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APPROX SHWT ELEVATION = 276.3 (EX=284.0 PR=284.9)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-11	^Ap	abrupt	smooth	10YR 3/3	-	-	-	-	gravelly sandy loam	weak medium subangular blocky	very friable	common to many fine roots
11-18	^AC	abrupt	smooth	10YR 4/3	-	-	-	-	gravelly sandy loam	weak medium subangular blocky	very friable	few fine roots
18-32	^C	clear	smooth	2.5Y 3/2	10YR 4/4 conc.	few	fine	distinct	gravelly fine sandy loam	weak medium platy	friable	Redox concentrations may have developed in compacted fill materials separate from the gravitational water table.
32-58	^Cdu	abrupt	smooth	Mixing of 2.5Y 5/3 and 2.5Y 3/2 with bands of 2.5Y 5/2	10YR 4/4 conc.	few	fine	distinct	gravelly fine sandy loam	massive	firm	See previous comment concerning redox conc. Wire fragments in layer.
58-74	2C1	abrupt	smooth	5Y 5/1	-	-	-	-	gravelly loamy coarse sand	single grain	loose	-
74-92	2C2	abrupt	smooth	2.5Y 6/3	-	-	-	-	gravelly coarse sand	single grain	loose	-
92-130	2C3	abrupt	smooth	2.5Y 6/1 and 2.5Y 7/1	-	-	-	-	fine sand to loamy fine sand	single grain	loose	-
130-134	2C4	-	-	2.5Y 5/2	2.5Y 5/4 coatings	many	coarse	distinct	gravelly sand	massive	very friable	2.5Y 5/4 coatings on coarse fragments. Free water observed at 132".

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 82"
License #:	D4039		Free Water Depth: 79"
Test Hole:	Test Pit 4		Seasonal High Water Table: 59"
Date	8/13/2026		Notes:

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APPROX SHWT ELEVATION = 271.8 (EX=276.7 PR=284.0)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-4	^Apu	abrupt	smooth	10YR 3/2	-	-	-	-	gravelly sandy loam	weak medium granular	friable	Glass and brick fragments. Common fine roots
4-6.5	^C1	abrupt	smooth	2.5Y 5/3	-	-	-	-	loamy fine sand	massive	very friable	-
6.5-8	^C2	abrupt	smooth	2.5Y 7/3	10YR 4/3 conc.	few	fine	distinct	loamy fine sand	weak medium platy	friable	Redox conc likely related to mechanical compaction of the layer and not the gravitational water table.
8-11	^C3	abrupt	smooth	2.5Y 6/3	-	-	-	-	loamy fine sand	massive	very friable	-
11-18	^C4	abrupt	smooth	2.5Y 6/2	a) 10YR 6/8 conc. b) 2.5 5/2 silt masses	a) common b) common	a)fine to medium b) medium	a) distinct b) faint	loamy fine sand	massive	very friable	Mottles and silt masses are likely from fill source material and not indicative of seasonal high water table.

Project: 203208 CNE Multi-Family Res
Location: Coventry, RI
Date: 8/12 and 13/2026

Soil Profile Descriptions

18-28	^C5	abrupt	smooth	2.5Y 6/2	a) 10YR 6/8 mottles b) 2.5Y 5/2 silt masses	a) many b) many	a) medium & coarse b) medium	a) prominent b) faint	loamy fine sand	massive	very friable	Mottles and silt masses are likely from fill source material and not indicative of seasonal high water table.
28-34	2C1	abrupt	smooth	2.5Y 6/3	-	-	-	-	loamy coarse sand	massive	very friable	-
34-36	2C2	abrupt	smooth	2.5Y 5/2	-	-	-	-	fine sandy loam	massive	friable	-
36-59	2C3	abrupt	smooth	2.5Y 6/3	-	-	-	-	loamy fine sand	massive	very friable	-
59-70	2C4	abrupt	smooth	5Y 6/2	-	-	-	-	loamy fine sand	massive	very friable	-
70-82	2C5	-	-	2.5Y 5/2 with inclusions of 2.5Y 6/2	-	-	-	-	coarse sand with inclusions of loamy fine sand	massive	very friable	free water obseved at 79".

Soil Evaluators:	Jeff Peterson *	Tim Piacentini	Total Depth: 90"
License #:	D4039		Free Water Depth: 87"
Test Hole:	Test Pit 5		Seasonal High Water Table: 41"
Date	8/12/2026		Notes: Large boulder encountered at 51"

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APPROX SHWT ELEVATION = 272.0 (EX=275.4 PR=283.1)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-14	^C1	abrupt	smooth	2.5Y 5/3	-	-	-	-	gravelly fine sand	single grain	loose	many fine roots
14-41	^C2	clear	smooth	2.5Y 5/3	-	-	-	-	loamy fine sand	massive	very friable	-
41-84	^C3	abrupt	smooth	2.5Y 5/3	10YR 4/4	common	fine	distinct	loamy fine sand	massive	very friable	large boulder at 51"
84-90	^C4	-	-	2.5Y 6/2	-	-	-	-	loamy fine sand with masses of silt	massive	very friable	free water obseved at 87"

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 120"
License #:	D4039		Free Water Depth: Not observed
Test Hole:	Test Pit 6		Seasonal High Water Table: 58"
Date	8/12/2026		Notes:

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APPROX SHWT ELEVATION = 276.5 (EX=281.3 PR=282.3)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-12	^BA	abrupt	smooth	2.5Y 4/3	-	-	-	-	gravelly fine sand	weak fine to medium subangular blocky	friable	many fine roots
12-18	^BC	abrupt	smooth	2.5Y 6/4 with lenses of 2.5Y 5/	10YR 4/6 mottles	many	medium	distinct	loamy fine sand with lenses of fine sandy loam	weak medium subangular blocky	friable	Mottles are likely from fill source material and not indicative of seasonal high water table.
18-58	^C1	abrupt	smooth	2.5Y 6/2	10YR 4/4	few	fine	distinct	loamy fine sand	massive	very friable	Mottles are likely from fill source material and not indicative of seasonal high water table.
58-108	^C2	abrupt	smooth	2.5Y 5/2	10YR 4/4	common	fine	distinct	loamy fine sand	massive	very friable	-
108-120	^C3	-	-	2.5Y 6/2	10YR 4/4	many	fine	distinct	loamy fine sand	massive	very friable	-

Project: 203208 CNE Multi-Family Res
Location: Coventry, RI
Date: 8/12 and 13/2026

Soil Profile Descriptions

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 120"
License #:	D4039		Free Water Depth: 115"
Test Hole:	Test Pit 7		Seasonal High Water Table: 70"
Date	8/12/2026		Notes: Excavation terminated due to pit collapse.

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APPROX SHWT ELEVATION = 274.2 (EX=280.0 PR=284.0)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-9	^Ap	clear	smooth	2.5Y 3/2	-	-	-	-	very gravelly loamy sand	weak fine to medium subangular blocky	friable	few fine roots
9-14	^C1	abrupt	smooth	2.5Y 5/3 mixing with 2.5Y 4/3	-	-	-	-	gravelly fine sand	massive	very friable	-
14-70	^C2	abrupt	smooth	2.5Y 6/3	-	-	-	-	loamy fine sand	massive	very friable	-
70-98	^C3	abrupt	smooth	2.5Y 6/2	7.5YR 5/8 conc.	many	medium	distinct	loamy fine sand	massive	very friable	-
98-120	2C1	-	-	2.5Y 6/2	10YR 5/8 conc.	many	coarse	distinct	gravelly coarse sand	single grain	loose	free water obseved at 115"

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 128"
License #:	D4039		Free Water Depth: 125"
Test Hole:	Test Pit 8		Seasonal High Water Table: 72"
Date	8/12/2026		Notes:

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APPROX SHWT ELEVATION = 268.9 (EX=274.9 PR=274.9)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-9	^BC	abrupt	smooth	2.5Y 4/3	-	-	-	-	gravelly loamy sand	weak fine to medium subangular blocky	friable	many fine roots
9-37	^C1	clear	smooth	2.5Y 5/3	-	-	-	-	loamy fine sand with 1-2" bands of coarse sand	massive	very friable	-
37-72	^C2	clear	smooth	2.5Y 5/3	-	-	-	-	loamy fine sand	massive	very friable	-
72-128	^C3	-	-	2.5Y 6/2	10YR 4/4 conc.	few	fine	distinct	loamy fine sand	massive	very friable	free water observed at 125"

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 55"
License #:	D4039		Free Water Depth: 47"
Test Hole:	Test Pit 9		Seasonal High Water Table: <47", estimated 14" based on TP10 WT/ESHWT difference
Date	8/12/2026		Notes: excavation terminated due to pit collapse

APPROX SHWT ELEVATION = 260.2 (EX=264.1 PR=268.0)

Depth (inches)	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-47	C1	abrupt	smooth	2.5Y 5/3	-	-	-	-	coarse sand	single grain	loose	-
47-55	C2	-	-	2.5Y 6/2	-	-	-	-	coarse sand	single grain	loose	free water observed at 47"

Project: 203208 CNE Multi-Family Res
Location: Coventry, RI
Date: 8/12 and 13/2026

Soil Profile Descriptions

Soil Evaluators:	Jeff Peterson	Tim Piacentini	Total Depth: 80"
License #:	D4039		Free Water Depth: 65"
Test Hole:	Test Pit 10		Seasonal High Water Table: 32"
Date	8/13/2026		Notes: excavation terminated due to pit collapse

33

APPROX SHWT ELEVATION = 259.5 (EX=262.2 PR=263.5)

Depth	Horizon	Horizon Boundaries		Soil Colors		Redox Description			Texture	Structure	Consistence	HTM artifacts/Other Notes
(inches)		Dist	Topo	Matrix	Redox Features	Abundance	Size	Contrast				
0-2	^C1	abrupt	smooth	2.5Y 6/2	-	-	-	-	loamy fine sand	massive	very friable	-
2-13	^C2	abrupt	irregular	2.5Y 6/3	-	-	-	-	coarse sand	single grain	loose	-
13-19	^C3	abrupt	irregular	2.5Y 6/3	-	-	-	-	loamy fine sand	massive	very friable	-
19-32	^C4	abrupt	irregular	2.5Y 6/3	-	-	-	-	extremely gravelly loamy fine sand	single grain	loose	-
32-55	2C1	clear	smooth	2.5Y 6/2	-	-	-	-	loamy fine sand	massive	very friable	-
55-80	2C2	-	-	2.5Y 6/2	10YR 2/1 and 5/4 concentrations	many	medium to coarse	prominent	loamy fine sand	massive	very friable	free water observed at 65"



Map Scale: 1:3,490 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HkC	Hinckley loamy sand, 8 to 15 percent slopes	A	6.1	20.0%
MmB	Merrimac fine sandy loam, 3 to 8 percent slopes	A	2.0	6.4%
MU	Merrimac-Urban land complex, 0 to 8 percent slopes	A	0.2	0.7%
Pg	Pits, gravel		21.2	69.5%
Sb	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	0.2	0.8%
UD	Udorthents-Urban land complex	A	0.0	0.1%
Wa	Walpole sandy loam, 0 to 3 percent slopes	B/D	0.7	2.4%
Totals for Area of Interest			**30.5**	**100.0%**

Appendix J – Meeting Notes

Pre-app meeting request through the portal - CNE Parcel 3-20260827_093207-Meeting Recording

August 27, 2026, 1:32PM

53m 17s

Gagnon, Ron (DEM) started transcription

GR **Gagnon, Ron (DEM)** 0:03

Started the recording, we can.
start the meeting. We can kick off with some introductions if you'd like. We can go around the room here at DEM and then we'll let you guys take it away. So I'm Ryan Gagnon with the Office of Customer and Technical Assistance. Nick Pisani, Stormwater. 41 sec, freshwater wetlands supervisor. And Hunter Terbridge, freshwater wetlands biologist.

SH **Scott Hobson** 0:30

I'm sorry, Ron, I couldn't quite hear the last name. My apologies.

GR **Gagnon, Ron (DEM)** 0:34

Hunter Trobridge, freshwater wetlands biologist.

SH **Scott Hobson** 0:38

Perfect. Thank you, Hunter. Just want to make sure that was clear to everybody.

CO **Chris Oliveira** 0:41

Film.

GR **Gagnon, Ron (DEM)** 0:44

You want to start with your guys, Scott?

MG **Matthew Gilchrist** 0:45

Ohh.

SH **Scott Hobson** 0:47

Yeah, go ahead, Josh.

Josh Rosen 0:49

Thanks.

Ron, thanks for setting this up for us. As always, appreciate it. I'll just introduce myself to start with the VHB team. Then we'll let you guys hear a quick intro from EG Home, which is the applicant for the project. So my name is Josh Rosen. I'm a project manager with VHB.

I also have a couple of staff members from our land development department on, and then Scott from the environmental side, but I'll...

Kick it over to Ashley.

Ashley Cunha 1:25

Yep, I'm Ashley Cunha and I'm a senior project engineer for VHB.

Kevin Sweatt 1:34

Right, Kevin Swatton, I'm a senior site in civil engineer for VHB.

Scott Hobson 1:35

Yep.

Scott Hopson, wetland scientist for VHP. Go ahead, Luke.

Luke Douglas 1:44

Hey, I'm Luke Douglas. I'm an environmental scientist with VHP.

Josh Rosen 1:49

Great, and then the EG team, Matt, can you introduce your group to DEM, please?

Matthew Gilchrist 1:54

Absolutely. I'm Matt Gilchrist. I'm one of the owners of EG Home. We're a production home builder. Currently, our headquarters in South Berry, Connecticut. We build on the shoreline, Stonington, Paukatuck area.

a lot and let here that whole area in Connecticut. And we're making our first debut into Rhode Island here at C&E. Kind of on the same vein of trying to support electric boats expansion and provide attainable housing for people that work in that industry.

This is Chris Bennett.
I'm Chris Bennett, I.
Oversee vertical construction near D.D. home.
Go ahead, John.

John McBride 2:44
Hey, John McBride, Land Acquisition Manager at E.G. Home.

Matthew Gilchrist 2:50
And then Chris Olivera is on the phone.

Chris Oliveira 2:53
Yeah, I'm just on the road, guys. Sorry about that. Chris Olivera, I'm in charge of land development.

Matthew Gilchrist 3:00
Thank you. That's it.

Josh Rosen 3:02
Great.
Appreciate it. So that's the group on our side. I just want to kind of kick the pre-app off with a quick overview of the project. You know, we definitely appreciate these meetings at the outset of our design and permitting phase. So we'd like to hopefully take the opportunity to show you guys at DEM what we're contemplating for the redevelopment of this land, and then really focus on, one, understanding if there are any issues, significant or otherwise, that you guys would be looking at for us.
to pay careful attention to during our design phase and our permit application. And then also too, is to understand where you see the permitting pathway for us or for this project and have kind of a quick back and forth on that. So
that we're preparing the appropriate application and understanding what the time frames associated with that review are. So what you're seeing on the screen, Kevin's sharing for me, we are basically proposing this project within the limits of what we call
parcel 3 at center of New England. This land is currently within the receiver of that of

this property area and EG Home is the applicant to build what you're seeing is 196 multifamily units.
within an array of duplex all the way up to 8 plex buildings on the property. The property itself is about 30 acres, as you guys probably understand and have seen and know from historical information. It's an old area that was mined for gravel. So it's very much denuded site in
within most of its area, a lot of gravel paths, a lot of old excavated areas where the gravel has been taken away, some wooded areas left. And when we did this layout that you're seeing on the plan, obviously working closely with the design program requested by EEG Home, we also had
access to your October 15th, 2024 Wetland Edge verification application 240163. So what we had done is taken the survey information provided to us by the previous firm that was involved in the project.
showing all the wetlands, all the site conditions. And then we've applied, Scott and Luke and their team have guided the way on having us apply the appropriate buffer zone designations, jurisdictional areas, et cetera, from those edges of wetlands.
that would match up with that delineation. So in doing so, we then prepared our layout, as I said, and interior to the site, we feel very confident that we're able to respect all of the required buffer zones and keep ourselves away from any formal or purposeful alteration of wetlands in the buffer zones and also
potentially any variances. Our roadway network, our units, our grading, central to the site are all outside of those areas. The 2 things I want to talk about to kick this off, therefore, are our access points. Those are the locations.
where we kind of just want to get your input on what we're showing and how and if we can do better in order to limit any impacts from your point of view. Kevin, if you don't mind, I'd like to just pan up to the secondary point of access right now.
Perfect. So this section of the site is adjacent to Angelina Drive. Angelina Drive leads into Dante Boulevard. It's in already developed residential armo center of New England. Previously, what we had seen with graphics and maybe you guys have met with others on concepts. The Angelina Drive connection point that you're seeing was going to be a full service access and egress point for a future development here. For a couple different reasons that we'll speak to shortly, this applicant
and our design team have taken that objective and basically decided to propose solely a secondary emergency access egress point through this corridor. So what you have between the well and system is an existing gravel Rd.

that can be passed today in and out of the site. And again, instead of making it a full access point, we're going to put a gated emergency access for the purposes of just that, emergency access vehicles. And in doing so,
We've changed the alignment in order to mimic the existing gravel path from a horizontal standpoint to the greatest extent practical so that we do not increase disturbances in grading through the corridor. We have to widen that gravel Rd.
on each side in order to get 20 feet to comply with the emergency vehicle standards. And we've done so in an area that we feel would reduce any grading or any filling in the wetland area. So what you're seeing is that's the sort of curvature of the alignment.
is done purposely to, again, reduce the disturbance, reduce the filling versus just a straight shot through there. You know, we're proposing the elevation of the gravel surface today would be the elevation of our gravel Rd. that goes through there for emergency vehicles going forward.
This is important to us because, again, we're trying to reduce the overall impacts on the project entirely, or in its entirety. So kind of treating it as a secondary access point and then reducing the amount of work here seemed to be of value.
to us and to the project as a whole. The fire department or the local fire chief has, by the way, reviewed our plan. So when we talk about the access points and what we're proposing and what we're going to talk about next at the primary location, that's all been reviewed. E.G. took the plans that you see to the local fire chief.
And Fire Marshal, and they're accepting of our...
proposal the way we're showing the concept and the layout. So maybe I'll just pause there for a second and Scott, if you wanted to, I'm not sure if you wanted to add anything. By the way, there is a culvert existing that goes underneath that road, but the end points of that culvert.
are, you know, in closer to the wetland edges, we wouldn't even need to touch the piping or change that flow within the waterway. So I just wanted to mention that.
And Scott, if you want to add anything quickly, the only other thing I'm going to say is we do have
As you can see here, with the access point, there is a connection to the sewer system as well that we need on Angelina Drive. So you see that we have a four-inch force main that we would put within the road bed or the gravel Rd. access to connect to our sewer flow.
to the downstream point in Angelina and send it on its way. So again, I'll pause,

Scott, if you want to add anything, and then I'd love to just kind of get DM your quick comments on this area particularly.

Scott Hobson 11:23
Yeah, Josh, I think you covered it well. It's important to note this is an existing earthen fill crossing. Josh mentioned the culvert. Looks to be a 48, seems to convey the flow appropriately. One thing Luke and I noticed in several previous alternatives was that there was side slope filling.
required to implement this road. And Josh had mentioned that straight alignment that created quite a bit of fill on the north side. So we worked with Josh's team to put that curvature in. And what you're seeing here, to my knowledge, is a representation of the grading. So we don't expect any fill to go down the current crests of those embankments.
Like Josh mentioned, this is coming in at grade. So we think that really is minimized and avoided what could have been some more significant impacts.

Gagnon, Ron (DEM) 12:16
And just God, this is Marty one sec. Those flight curves, I think I heard Josh say, is all set with the fire folks.

Josh Rosen 12:27
Yes.

Gagnon, Ron (DEM) 12:29
Yeah, okay, great.
Would the bridge need to be widened as part of the road widening initiative?

Scott Hobson 12:42
with the bridge. It's actually what we believe is a 48 inch RCP.

Gagnon, Ron (DEM) 12:47
Okay.

Scott Hobson 12:48
So there would be no need to excavate down to that or, you know, to replace it. So

what you see here is the earth and fill embankments should be sufficient for the project.

Josh Rosen 12:59
Those ends extend beyond already beyond the corridor and where we would need to to widen.

Gagnon, Ron (DEM) 13:06
Okay.

Josh Rosen 13:12
Okay, I think I'll have Kevin pan over to the other location that we kind of wanted to point out. And by the way, if DM, if you guys see anything that we should be talking about inside the site, I didn't want to.
you know, skip over anything, but if you have any comments or questions on, you know, internal to the parcel limits, we're certainly happy to discuss that. I just, I just figured that these two,
issues or locations would be the hot topic. So that's why we're starting with that.

Scott Hobson 13:49
Josh, real quick for the recording, I would just mention, I think this is pretty clear, but the green coloration represents the buffer zone and the red represents the 20 foot primary building setback. So this design was able to abide by the 20 foot setback, including decks from what I've seen on the entire plan.

Josh Rosen 13:51
Yep.
Yeah, good point.

Scott Hobson 14:08
and the termination of grading ends right at the buffer zone limits where it needs to. Otherwise, it even respects the red 20 foot setback. So we just want to make sure everybody understood that the red was that setback.

Josh Rosen 14:23

Yeah, it's a great point, Scott. Thanks. Kevin, just really quick for the record kind of, or just for the perspective, can you just pan out one more time before we go back to that?
And so the guys at DEM can see what we were talking about. Perfect. Perfect. So that's the perspective on the green and the red from 20,000 foot view for you guys. And just zoom in a little bit, Kevin, on the perimeters of those. Kind of just highlight what Scott was talking about that our building.

Scott Hobson 14:50
Yeah, just any representative area.

Josh Rosen 14:52
Yeah, that our buildings and decks are out of the red area.
And the grading might be in the red a little bit here and there, but it...
This isn't the final, final grading plan, but for now, we're also again out of the green with any, certainly out of the green with the grading. That was our intent. Okay.
So going back to the other access point. So on this plan, what we're seeing in the bottom left corner is basically the current, you can kind of get a pretty good aerial view here too of the center of New England Boulevard crossover Rd.
in its graveled sub-base condition, which I know you guys all know about and have permitted previously. And now that connection is under construction through the receiver and DM are doing the work. You can see that we are proposing what will be the primary access and egress to the Lot 3 development from the eventual finished connection of that Center New England Boulevard crossover. And if Kevin, you can zoom in slightly here a little bit more, you can see that with their construction, they had left.
Sort of this E or.
stub for a connection point theoretically for the future Rd. that was intended here.
Again, this, you guys might even know this better than we do at VHB because we weren't part of that and not part of the current construction, but it is intended and Matt, jump in just for reference, that that road should be completely paved by the end of this month. Is that correct? After some work is done with the gas company? Is that accurate?

Matthew Gilchrist 16:48

Yeah, the.
That's the plan. I can foresee it going into maybe the first weekend in October, just because the gas line was a late addition. So, you know, it's either going to be into September or fully paid by early, early October.

Josh Rosen 17:06
So, so that is that is our primary intended connection point we have. Kevin, can you bring that? Perfect.
If you can bring that last plan back up. We have the specific intent to use, again, the stub, let's say, as our starting point to bring the new Rd. in. That location also features its own existing gravel access Rd.
so to speak, that goes through the flagged wetland edge into the site already. Again, same situation. It's not as wide as what we would need for our fully functioning roadway. So we have a bit of widening. We're using a one
one lane in and two exit lane approach at the specific intersection based on the development's needs. We have a sidewalk on one side of that road system and then we are bracing the corridor
the new roadway corridor with retaining walls. And we know that there's two existing stormwater culverts underneath the road. They're both 15 inch size. And in doing so, And starting at elevation approximately 296, you'll see that really we're talking about a 10 to 12 foot difference between the new road bed and what's existing, which is sort of what has to be given.
given our connection point and the grades that exist today and how the center of New England Boulevard connection was designed and has been built. We would bring our water supply in from Center of New England Boulevard that they have an existing water main that's we've gone through Kent County Water.
And that is the ideal point for that water line that you're seeing that goes through our corridor. We'd also bring our electric service through the same Rd. corridor.
Again, I'll pause here because I'd like Scott to add any
On.
no notations that you would like to and then like to hear if on DEM side if we've missed anything or should consider something in our design and moving this forward and then definitely want to understand how this section ties in with the rest of the permitting.

and that process for the entire project.
So, Scott, if you wanted to add anything, please jump in.

Scott Hobson 20:03
Yeah, I would just add that the river that's shown to the left there flows to the north. That's been culverted under center of New England through big box culverts. Looks like one primary and two secondary. And then the wetland that you're seeing to the right or east of our proposed entrance.
is quite a bit elevated above the other wetland. Josh mentioned the two 15-inch culverts carrying that flow under the existing gravel roadway towards the river. Other than that, I think it's important to understand, like Josh mentioned, that there will be retaining walls to minimize impacts, and that roadbed will be significantly elevated above
the wetland elevations. And Hunter, you've probably seen this is my guess, but I'll leave it at that.

Gagnon, Ron (DEM) 20:55
Do you know the cumulative impacts to buffer zone from widening that road?

Scott Hobson 21:04
Yeah, we have not calculated that, Josh. I don't know if you guys have.

Josh Rosen 21:09
We have, we have not yet.

Scott Hobson 21:16
So one thing we're seeking today too is your recommendation on the application type.
And by the way, do you guys have 1/2 an hour for this? I saw Ron, it was scheduled for half an hour.

Gagnon, Ron (DEM) 21:29
No, I just, I was doing a lot of meetings at the time and I didn't add the extra half hours on the calendar. So I believe we're good until 1130, whether by 1030.

Scott Hobson 21:34
Mhm.
Okay, all right, very good.

Gagnon, Ron (DEM) 21:51
So the real key to the RIME is if you're able to use those existing access points into the parcel and you're basically
Correct me if I'm wrong, Scott, there's no filling of swamps associated with this, correct?

Scott Hobson 22:11
Based on this, I think we're nipping that E wetland with the wall. You can see the red line is the wetland edge. So we're into that a little bit. What that looks like, Marty, is basically a mudflat in there with a tiny, tiny little stream that's coming towards those culverts. And then it looks like a little bit of wetland comes into the proposed Rd. So the footprint would

Gagnon, Ron (DEM) 22:19
Yeah.

Scott Hobson 22:32
impact that as well. So it looks like there will be some minor swamp fills.

Gagnon, Ron (DEM) 22:40
Um, I knew that you have retaining walls there, so OK.

Scott Hobson 22:46
Yeah.

Gagnon, Ron (DEM) 22:47
Who?
Yoga.

Josh Rosen 22:50

Just show you guys, not to interrupt you, Mario, but don't know if you were going to ask about the sidewalk improvement, but one of the things that was a mandate from the town side of things when this project was approved at master plan,

GR **Gagnon, Ron (DEM)** 23:02
Okay.

JR **Josh Rosen** 23:07
Was that that sidewalk, you know, would would have to exist for the project to move forward, so we did, as an alternative, try to seek, you know...
that less less impact by not using that sidewalk system, but it was it was not something that we could do moving forward. So we just we have it on one side instead of both, but that was an alternative we looked at to reduce the impacts.

SH **Scott Hobson** 23:40
And we did switch it to the east side to try to keep it away from the river as much as possible.

GR **Gagnon, Ron (DEM)** 23:49
Access by bottom.
All right, can you can you zoom out so I can get the whole picture again, please?
I.
So...
The design is...
Very good in that avoidance.
mandate for the rules has been really, really paid attention to and the department really appreciates that because there's been a lot of talk about what to do with certain parcels here and some of them have been in left field and some of them have been really, really good and this is the latter.
Um...
There's some encroachment there. I, you know, Scott.
It's wetland-filled, it's some disturbance, it's very minimized.
Ohh.
I'm thinking as far as an application process goes.
Because I don't want to surprise if we go with a variance, submit it as a formal and

make an argument for how this can be downgraded by all the minimization techniques that have been employed and demonstrate how the impacts are going to be minimal.
As a result of this proposal, even though there is some some nipping of of of wetland and buffer, I.
I think that's the best way to go here. I don't want to surprise by going with the variance and then finding something else that I don't see here on paper.
You can submit.

SH **Scott Hobson** 25:42
Okay, we appreciate that guidance, Marty.

GR **Gagnon, Ron (DEM)** 25:45
You, you can go ahead.
As I say, if you submit it as a variance, that's possibly going to be okay. I just don't want the uh-oh after we've after that's been submitted.

SH **Scott Hobson** 25:58
Mhm.

GR **Gagnon, Ron (DEM)** 25:58
And because there is wetland encroachment, as minor as it is, and that's really wonderful, this design is really, really, a lot of thought went into this, I'll put it that way. I just don't want...
is to be derailed once we get it on track and moving forward. If you submit it as a formal application and we're able to downgrade it, that's wonderful. If we're not able to downgrade it for whatever reason, once we get in there and look at this thing and start dissecting it and assessing it ourselves once we've got a specific proposal in front of us,
If it's determined that this does need to go through the formal application process, you haven't lost any time. You're well into the process.
And that would just try to get it up to public notice, but I think you've got a pretty good leg to stand on to.
and try to demonstrate to the department that this is something that would not need to go through the public notice period because the alterations are not going to be

significant. That's an argument you'd have to convince us of. And maybe you can from what I see and from what I know of the site.
Ohh.
But that's not the safest way to proceed.

Scott Hobson 27:22
Okay, we appreciate your thoughts on that, Marty.

Gagnon, Ron (DEM) 27:24
Now, I'm very hopeful that it would be downgraded. I'm very hopeful.

Josh Rosen 27:25
So...
So, I just, just to be clear, and so like maybe E.G. home crew can hear Marty and I could ask Scott after, but what you're saying is we would submit the application as a formal, but...
in that application submission, we would request the consideration that it would actually be looked at as the variance, and then you could make that decision when, meaning DEM can make that decision while they're reviewing the application. Is that?

Gagnon, Ron (DEM) 28:07
Correct, correct. I'd like to give, you know, as the applicant submitting, as the quote submitting on behalf of the applicant, you would make the, you know, you're going to say, we've done this, we've done this, we've done this. And as a result of all these techniques that we've employed in the avoidance
techniques that we've employed, we feel that this would not necessarily be a significant alteration because, you know, and that's where biologists comes in and notes what's done, what measures have been taken, and what is being impacted in if it is your opinion that what is being impacted will not result in a significant alteration to the entire wetland. I would say, Scott, since there is some nipping here a little bit, if I'm not looking for wetland replication, I'm just looking for mitigation. Just make sure that
Maybe some plantings are put in, which would be help offset the disturbance that would be associated with that with that southernmost Rd.
Um...

Just, you know, do some enhancement by what the department is not looking for replication.
No way. The other thing, the other thing that I'm looking at this, and we've had a lot of discussions on this entire part, on this entire site, not just parcel 3. And there's some parcel to the east of this. And in some discussions, there was talk about connecting this parcel to that parcel.

SH **Scott Hobson** 29:25
Okay.

GR **Gagnon, Ron (DEM)** 29:44
And I don't know if that's still something that's being looked at because I know that the road that the department just approved, now the very southwestern corner of this slide, that road goes down to the east. I don't know if access would be gained from that or off of Arnold Road, but
I just want to mention that it was there was some discussion on those on this parcel connecting the other parcels, and I don't want to authorize this parcel up if it's going to, not my problem, but if it's going to jeopardize another parcel, you know, in case the town needs a double access there, you need to come through this parcel to get that parcel of the dual access, just, I'm just throwing it out there. We can look at this, we can review this and be compositive person who I am, we can approve this, just try to be cognizant of the rest of the parcel. I don't want this to jeopardize the rest of it.

JR **Josh Rosen** 30:45
Yeah, that, that's a great, that's a great point. Sorry, go ahead.

MG **Matthew Gilchrist** 30:46
We don't have...

SH **Scott Hobson** 30:48
Yeah.

MG **Matthew Gilchrist** 30:50
Josh, we don't have any contractual obligation to allow connection for vehicles or anything like that to be to our development. There was talk for utilities, but right

now, parcel 4, which is the parcel you're referring to, has
basically self-sustainable utilities. They're going to go a different direction with their sewer. So really, we're a self-contained development. We do intend to maybe put a pedestrian walking trail along the area that's already a trail.
just to allow, you know, maybe some passive enjoyment of that open space there and another pedestrian corridor, unimproved, but a pedestrian corridor all the same to the shopping and those amenities that are along CNA. So we don't have any requirement or responsibility to provide individual access to our site from parcel 4.

GR **Gagnon, Ron (DEM)** 31:58
Yeah.

JR **Josh Rosen** 31:59
And Marty, we are involved in...
some of the schematics that are being put together for lot 4 and an additional lot actually on the other side as well. So, you know, everything Matt's saying is obviously accurate, but to the point of we are even investigating with the town and
The owner of four and five, you know, even other secondary means of access to those to and from that those parcels, and it does not include the connection between.
Between that area and this lot 3. I will just mention briefly for perspective that it can not if you can pan back to the other slide. EG is considering being part of the.
future development on lot 2, which is adjacent to the project here to the north on the page. And so that would be one sort of continuation point to complete the redevelopment of this area.
Just wanted to make that a point.
Once this project gets off the ground and starts to design, I think we'll be looking at that further with the team. But you can see where the railway system to the north expands up into lot 2 already. That was for us to plan that layout. So although it's not part of this application, it won't be, but
No, that's at least the vision for that area, just so you guys are aware of that.
And it'd be the same model, same type of program for building multifamily.
So.
Yeah, we appreciate that guidance. And then one last thing on that permitting discussion or topic. With the formal application, the alternative that you were kind of

alluding to is we would try to initially
apply as a variance, but that would, going that route, I think what you had said is if the department determines it's not a variance, and in fact it would be a formal during that initial review, we'd actually be kicked back out and have to come back in with an application.
and lose that review time. Is that fair to, is that accurate the way I...
Is that, is that accurate? So, okay, okay.

GR **Gagnon, Ron (DEM)** 34:43
Yeah, that's exactly what would happen. So, by submitting it as a formal, you don't, if you submit it as a variance and we say, oh, this represents a significant alteration because of these reasons here, yeah, that application is terminated and you're required to submit a new one and you get back in line.

JR **Josh Rosen** 35:02
Got it. Okay. So that's an important piece of this too from a timing. Okay, great.

GR **Gagnon, Ron (DEM)** 35:02
Oh.

JR **Josh Rosen** 35:09
Great.

GR **Gagnon, Ron (DEM)** 35:09
So timing, overall timing, so if it's submitted as a fall application, it's able to be downgraded, probably the initial review is going to be 45 to 60 days. A project this size for one reason or another is likely to have some comments to hire a few things out. So at the end of that 45 or 60 day period, we'd be getting comments out to you, I would imagine.

SH **Scott Hobson** 35:09
Josh.

GR **Gagnon, Ron (DEM)** 35:34
However long it takes to return it to the department, we probably get that response.

It would be another 30, 45 days. And that's, I'm guessing, because things are actually kind of wonky here. That's my problem. So
And then after that 30 to 45 day agreement, we get hopefully a final decision out. Sometimes it's more tweaking that needs to be done. Every time there's a request for additional information, it's probably 30, 40 days when it comes back in for us, things being what they are. I'd like to make that a lot faster, but
It's a little difficult at the moment, so that's the timing if...
And then after the request for information has been addressed, we issue a permit. So that's that time scenario. So you're looking at, you know, roughly ballpark, three months. That's just full ballpark, but it gives you an idea. If we go through the formal application process, we do the same thing after that 45 to 60 day period. We go back with comments, you come back in,
Then we have to, when the comments are deemed fully addressed, and there are additional...
milestones that need to be done with a formal application that don't have to be done with the variance. It is a little bit more of a stringent submission. There is more detail that's necessary. The biological evaluation is more in-depth than what we would normally get with maybe a variance, sometimes not, but
probably in this case. So there is more prep, there is more bulk, so to speak, to the application that the department would need to be reviewing. If it's determined that it's going to stay as a formal, once we've gotten through the material and it's adequate for public notice, the request
hard copy plans to be mailed out to the abutters and to the town. That's about a two-week period to get that straightened out. And then it's a 45-day public notice period. And then generally speaking, at least it's getting better in my world, it's about six weeks to get the decision out after the end of the public notice.
It was running six months recently. I've got it down to about six weeks, about. And hopefully that trend continues. So that's the timing of the formal application, which generally translates to
Seven, nine months, and I'm just factoring in things that I know are gonna blow up here that I'm trying to take into account. That is, again, our problem.

JR **Josh Rosen** 38:15
Okay, so three to four months potentially for the variance, seven to nine months for

the...
Full formula.

Gagnon, Ron (DEM) 38:25
That's 839. This is realistic.
Yeah, three, four months. I'm leaning toward three formal, you know, 8, nine months.
I don't know. It's a lot happening here.

Josh Rosen 38:36
Okay.

Scott Hobson 38:49
All right, great. Thanks for laying that out, Marty.

Josh Rosen 38:54
Matt, any?

Scott Hobson 38:54
Josh, if you're set with that, I've got to, oh, go ahead.

Josh Rosen 38:57
I was just going to ask Matt if he had any other questions for Marty and his team while we have him on the line here.

Matthew Gilchrist 39:07
No, wasn't there a initial variance already given on this connection point? I thought that there was already initial variance that was approved.

Gagnon, Ron (DEM) 39:20
Not familiar with that.

Scott Hobson 39:23
You thinking zoning or wetlands, Matt?

MG **Matthew Gilchrist** 39:26
I thought it was for weapons, but...

GR **Gagnon, Ron (DEM)** 39:30
I don't recall, just...

JR **Josh Rosen** 39:30
Nothing that, nothing that we've done, Matt, so I don't know if...

GR **Gagnon, Ron (DEM)** 39:35
Which is?

JR **Josh Rosen** 39:37
Something happened before, but...

GR **Gagnon, Ron (DEM)** 39:37
And the only tonight.
And the only thing I can recall is the department's been involved with with this particular parcel is verifying wetland edges.

MG **Matthew Gilchrist** 39:50
I'm sorry, what was the last part?

GR **Gagnon, Ron (DEM)** 39:52
The only thing that the department I'm familiar with on this particular parcel is that we were able to process an application for verifying wetland edges. That's all I can recall.

MG **Matthew Gilchrist** 40:06
Okay.
All right, Josh, you have to stay on when we're done.

JR **Josh Rosen** 40:11

I know, yeah.
What's that?

Matthew Gilchrist 40:16
Josh, you have a few minutes to stay on once we're done.

Josh Rosen 40:19
Yeah.
I know Nick, Nick's sitting there with DM. Nick, I didn't want to gloss over any of the things that you're probably interested in. We are heavily involved with the stormwater design currently. We've done test pitting. We've looked at the floodplain. There's
A little bit of floodplain at the very beginning on the river side, but we're out of it with all of our work and the rest of the development. We're obviously paying close attention to all the recharge and all the other stormwater requirements that are in the regulations.
And so that's progressing. Right now we have just a little snapshot is that we have a sort of a hybrid system where we're using some at grade stormwater BMPs where we can. We're also using some below grade for infiltration and such.
but we are pretty aware of the items that you'll be paying close attention to. So we have those at the front of our thought process. If there was anything else that you wanted to comment on, I wanted to give you the opportunity if something site-specific that you picked up on.

Gagnon, Ron (DEM) 41:41
It's a large project, so you'd be doing perhaps a downstream analysis part of the regulations. Need to look at that.

Josh Rosen 41:49
Yep.

Gagnon, Ron (DEM) 41:52
And also for the existing condition ground cover, the rules say to use, you know, a good condition hydrologic rule for a vegetated ground cover on the existing condition, regardless of what's actually there.

Josh Rosen 42:19
Looks.
Yeah.

Gagnon, Ron (DEM) 42:28
Those are those are the main points, I think.

Josh Rosen 42:34
Great. Appreciate it.

Scott Hobson 42:34
Yeah, Josh, glad you brought the floodplain. That's what I was trying to say before, was that that's pretty much confined to the channel from what we gather, Nick. And that wall should be out of it. If we need any compensation, we'll certainly provide it.

Gagnon, Ron (DEM) 42:49
Yeah, mostly the water quality in the peak flows would be the main concern.

Josh Rosen 42:55
Understood.

Gagnon, Ron (DEM) 42:59
And in channel protection volume, you know, channel protection, you know, flows the metering out of the one year storm.

Josh Rosen 42:59
Right.
Actually, Kevin, from on my side, and did I miss anything? Do you guys have anything that you thought we should we needed to ask at this meeting? Are we good?

Kevin Sweatt 43:25
Good trust.

Josh Rosen 43:26
OK.

Ashley Cunha 43:27
I think we're good. Obviously, we plan on meeting all stormwater requirements.

Josh Rosen 43:35
Mhm.
Right, Scott, you are we we pretty well set then?

Scott Hobson 43:44
Yeah, I've got a few things, Josh, I want to go through. Marty, will, given that we're nipping some wetlands, we'll be looking into the Army Corps as well.
And then Josh, if you could go over the entry Rd. with the ownership, Marty, there's another parcel involved, the same parcel as center of New England. We are wondering, there's an easement. We're wondering if we need to have co-applicants on this or a notarized letter.

Josh Rosen 44:03
Yeah, that's right.

Scott Hobson 44:12
So, Kevin, if you could pull up that easement plan.
I don't know if the easement in itself is sufficient to cover that or how we handle the applicant situation.
with two parcels under different ownership.

Gagnon, Ron (DEM) 44:26
I got you.
Yeah, I actually had that flagged before this meeting ended to bring up that at the initial start of the meeting, it was noted that it was still in receivership and then E.G. Holmes would be the applicant. So one thing that's necessary is the owner of the parcel was the only person that would be the applicant.
unless there's a conveyance or some kind of documentation that the owner is

allowing another entity to submit an application on their behalf. So I just wanted to clarify, make sure that gets clarified because when we receive the application, we have to have documentation that shows
that the applicant actually is in control of the property or has been given control of the property. As far as the easement goes, it's going to be pretty much the same thing. Either we're going to need a co-applicant to say they're authorizing these wetland alterations as part of that proposal, or you're going to have to get some conveyance from the
existing owner that clearly, that clearly demonstrates that in this case, E.G. Homes can be the applicant to submit an application to alter those wetlands. We get a lot of bogus, I'll be blunt, bogus paperwork and documentation
trying to show easements and that certain people have control. And I'm just emphasizing I don't want any up-pos on this project. This project's too important to the state of Rhode Island. It's a necessary project to be done in the right way, and I'm looking at a project that looks like it's doing it the right way. So
just to make sure we got all our I's dotted and our T's crossed. So as far as that easement goes there, the access, I'm not a lawyer, I get this paperwork, I always send it upstairs to our legal team, just make sure that when this comes in and I'm forwarding paperwork to our legal team to analyze this.
Your legal team has made sure that they've addressed what the what the department is requires in order to process an application.

MG **Matthew Gilchrist** 46:42
Yeah, the sooner we can get that information, if you can let us know what your legal team needs, we can have either an affidavit prepared by the receiver or if necessary, we can pick a court order, verify that the receiver has given us permission to access this easement and
Operating wells, so...

GR **Gagnon, Ron (DEM)** 47:06
Yeah, it again, it's not my that we went to to know what's what's acceptable, not acceptable, just so you know, I just fire it upstairs to the the property people on our legal team and they and they let me know if it's good to go or not.

MG **Matthew Gilchrist** 47:23

Excellent.
All parties here are working pretty hard together to get this done, so we can get you whatever paperwork you need.

Gagnon, Ron (DEM) 47:34
Yeah, this is this is great. I appreciate that.

Scott Hobson 47:39
All right, thanks, Marty. The other thing I had was that this parcel is entirely within Natural Heritage Polygons. We've contacted the DEM database manager. It looks like species are in the southwest portion of the property. Luke and I have been out there kind of on a cursory basis. We haven't seen every inch of it.
but we did not see anything. We will be heading out again. And I'm curious, what is our obligation to find those and how to comply with the regs based on that presence? Those were 2019 recordings. The site is in a process of flux being a gravel operation.

Gagnon, Ron (DEM) 48:16
Yes.

Scott Hobson 48:20
So succession is happening and things are changing quickly. So we don't know if the species might even still be there. Two of them are requisitums. Chances are they're in the wetland. We haven't seen the entire wetland complex. But just curious on that, Marty, if you have any guidance.

Gagnon, Ron (DEM) 48:37
Yeah, if you, if it, if it 2019, that's not bad.
It's just, if it was observed there in 2019, yes, there is succession going on, but that's, you know, that's, you know, when you submit an application, that's one of the things that is part of the analysis. So the fact that there's species on the property basically is a red flag. You do your due diligence to identify it.
Do you do due diligence to?
describe the habitat where it would expect it to be on the parcel, then if you can show that you're not altering that particular habitat where that particular species

would be expected to grow, you've kind of addressed the issue, even if you don't find it. If it was a sighting from, you know, 1974, I would be
Totally thinking differently, because there are a lot of sightings that hasn't been seen in 50 years, but...
2019, yeah, that's pretty recent, actually, in the scheme of things. Also, Scott.
Make sure you document when the plant is most apt to be observed, because some plants come and go in a matter of a few months. So just make sure that you show that you were there when the plant should have been there, so that we just don't discount whether it went for a long time of year. Of course, they didn't see it. Just make sure that kind of thing gets documented.
If you don't find it, just demonstrate that you're avoiding the habitat where it likely would be.

SH **Scott Hobson** 50:11
Okay.
Yeah, we're aware too, the growing season is coming to an end pretty soon. So we were talking about that. It looks like it could be inside the tree line. So I'll be taking a look to see the relationship of our project limits to that tree line. So that's another thing that could hopefully help.

GR **Gagnon, Ron (DEM)** 50:31
Yeah.

SH **Scott Hobson** 50:36
But the other thing, Marty, what if it's an equisetum in, say, a depression formed by a gravel operation?
Probably doesn't matter. Or what are your thoughts on that? So an artificially created habitat, it's going to be gone in however many years due to the process of natural succession.
Is that a showstopper, I wonder?

GR **Gagnon, Ron (DEM)** 50:59
It, it could be, it could be.
It's A case-by-case basis. You know, if it is in an area that is, it's not going to be there in five years.

You would need to clearly analyze and demonstrate that and convince us that that's the case. That's not always easy, but that would be that would be what you'd have to do.
Yeah, that could be a problem. I don't know what to tell you except that, you know, just do the best you can to do that analysis and avoid those areas where if it's not found,
Now, if it's a jurisdiction, that's what's problematic if it's outside jurisdiction.
Maybe another story.

SH **Scott Hobson** 51:48
Right, yeah.
And to your knowledge, is Amanda Fredas the one to work with on that? That's who we corresponded with.

GR **Gagnon, Ron (DEM)** 51:57
At the moment, yeah, exactly. At the moment, she probably is the best person.

SH **Scott Hobson** 51:58
Now that Paul is still...
Okay.
Okay.

GR **Gagnon, Ron (DEM)** 52:05
They haven't replaced Paul. I don't know how they will or when they will.

SH **Scott Hobson** 52:15
All right, very good.

JR **Josh Rosen** 52:21
Right.

SH **Scott Hobson** 52:22
Josh, I believe that's all I have.

JR **Josh Rosen** 52:25
Yeah, thank you.

SH **Scott Hobson** 52:26
Yeah.

JR **Josh Rosen** 52:27
Ron, will you at some point circulate the minutes from this meeting from the recording?

GR **Gagnon, Ron (DEM)** 52:32
I will, I can circulate the transcript. Yes, I can get that out to you guys.

JR **Josh Rosen** 52:40
All right. I think we are good. We are good. Thank you very much for your time, guys, and your input. Appreciate it.

MG **Matthew Gilchrist** 52:48
Thank you very much, guys. Thank you.

GR **Gagnon, Ron (DEM)** 52:50
Right. Thank you.

SH **Scott Hobson** 52:51
Yeah, thank you. Marty, glad things are working out with the time frames there. Good luck with it all.

JR **Josh Rosen** 52:52
All right. Take it. Whip.

GR **Gagnon, Ron (DEM)** 52:56
Yep, thank you very much, everyone. Nice job.

SH **Scott Hobson** 52:58
Alright, take care.

JR **Josh Rosen** 53:00
Thank you.

AC **Ashley Cunha** 53:00
Thanks.

LD **Luke Douglas** 53:00
Yeah, thanks, guys.

CO **Chris Oliveira** 53:10
John, you still on, bud?
That man said he wants someone to stay out.

◉ **Gagnon, Ron (DEM)** stopped transcription